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Divergent Asian Views on Foreign Direct Investment and Its Governance

DOUGLAS H. BROOKS AND HAL HILL

This paper reviews recent trends and effects of FDI in developing Asia; domestic policy changes in six Asian host economies (People's Republic of China, India, Republic of Korea, Malaysia, Thailand, and Viet Nam); and how these policies and experiences influence their attitudes toward managing FDI. Not surprisingly, these countries have differed in their approach to the formulation of international regulations governing FDI. To simplify, their negotiating positions have ranged from strongly in favor (Republic of Korea) to strongly opposed (India); from viewing it as a helpful spur to domestic liberalization (Thailand) to a constraint on development policy options (Malaysia); and from acceptance if implementation is gradual (People's Republic of China) to concern over capability to address the difficulties and challenges of achieving compliance (Viet Nam).

The surge in flows of foreign direct investment (FDI) in the last two decades has had important effects on global value chains of production, developing countries, and attitudes toward such investment. Attitudes toward FDI and experiences with it in developing countries affect host economy policies, which in turn affect subsequent experiences. Both FDI policies and experiences, as well as their perceived feedback, influence attitudes toward negotiating a multilateral framework for investment. This paper reviews recent trends and effects of FDI in developing Asia, domestic policy changes in six Asian host economies, and how these policies and experiences influence their attitudes toward managing FDI.

The paper is organized as follows: Section I examines recent FDI trends, briefly reviews the general literature on the benefits and costs of FDI for host economies, and assesses progress on bilateral investment treaties (BITs). Against this backdrop, Section II investigates FDI regimes and patterns in six diverse Asian economies—People's Republic of China (PRC), India, Republic of Korea (Korea), Malaysia, Thailand, and Viet Nam. Particular attention is accorded to

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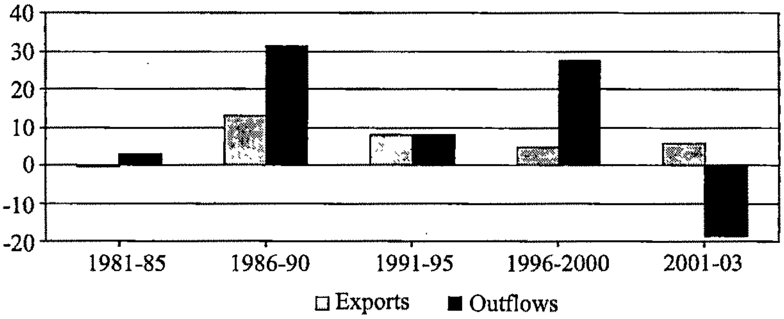
changing FDI policies in the context of broader economic reforms, including the adoption of more open trade policies, and the consequent shift from "rent-seeking" to "efficiency-seeking" foreign direct investment. Section III summarizes the principal arguments.

I. RECENT TRENDS AND EFFECTS

A. An Overview

From only $53.7 billion in 1980, global FDI outflows reached $1.2 trillion in 2000. The upsurge in FDI substantially changed the international economic landscape. From 1980 to 2000, the growth rate of world FDI outflows surpassed that of world exports (Figure 1). This swift expansion in FDI was more pronounced during 1986-1990, when many host countries began to relax regulations to attract FDI, and 1996-2000, when companies undertook scores of mergers and acquisitions (M&A) in the wake of the Asian financial crisis and privatization programs in Latin America. Since 2000, however, a weak global economy has considerably reduced outflows, which dropped by 41 percent in 2001, a further 9 percent in 2002, and remained flat in 2003.

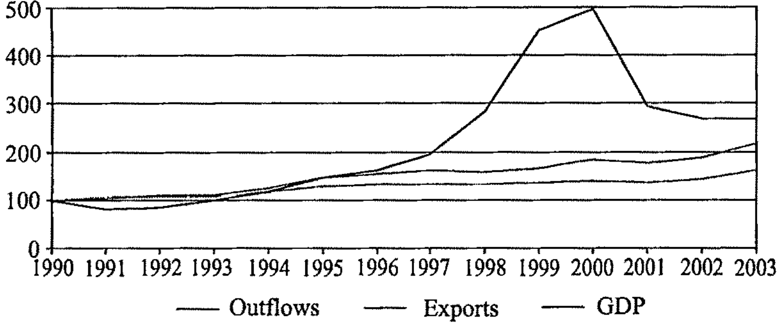
Figure 1
Growth of World Exports and FDI Outflows
(average annual growth rate, %)



Note: Data for outflows in 2003 are preliminary.
Sources: IMF (2004a), UNCTAD (2004).

Relative to world output and exports, FDI outflows have risen tremendously since the early 1990s (Figure 2). World FDI outflows increased five times from 1993 to 2000 before falling since 2001, while world exports and output grew at a more modest pace, with output not even doubling in value between 1990 and 2003.

Figure 2
Index of World Exports, Output, and FDI Outflows, 1990-2003 (1990=100)



Note: Data for outflows in 2003 are preliminary.
Sources: IMF (2004a) and UNCTAD (2004).

The geographic pattern of FDI outflows changed slightly during the 1990s Europe and North America continued to be the largest sources of FDI flows in th world, supplying at least 75 percent since 1991. In contrast, the share of the Asia and Pacific region in total FDI outflows fell significantly beginning in 1998 due t the declining role of Japan as an FDI supplier.

While Europe and North America continued to be major recipients of FDI the PRC emerged as another favored destination. Economies in the Asian an Pacific region received increasingly larger shares of world FDI inflows beginnin in the 1990s, but the 1997 financial crisis temporarily reversed this trend. Foreig direct investment flows soon recovered, particularly in the wake of M&As afte the crisis.

In terms of individual country destinations, there have been shifts in th preferences of foreign investors over the last decade. Argentina, Malaysia Portugal, and Thailand, which were among the 20 largest FDI recipients durin 1990-1992, were replaced by Brazil, Denmark, Germany, and Ireland durin 2000-2002. In addition, Japan and Korea became preferred locations for FDI i the post-Asian crisis era (JBICI 2002).

Among the favored Asian destinations for FDI, there has not been as muc change. Indonesia and the Philippines, two of the top 10 FDI destinations in th early 1990s, dropped from the list primarily due to uncertainties in their domesti economies and were replaced by India and Kazakhstan in the early 2000s Meanwhile, Hong Kong, China overtook Malaysia and Singapore as a preferre FDI destination. While the total value of FDI inflows to the top 10 Asia destinations substantially increased during the last decade, the Asian and Pacifi region's share in world total dropped. Average FDI inflows per capita showe remarkable increases in some Asian economies. In Hong Kong, China, fo instance, per capita inflows increased 10.3 times to $4,836 between the earl

1990s and 2000s and inflows were more than three quarters of gross fixed capital formation by the start of the decade. In other Asian economies, inflows amount to over 40 percent of gross fixed capital formation (Table 1).

Table 1. **Top 10 FDI Recipients in Developing Asia**

Rank	Host Economy	1990-92	Rank	Host Economy	2000-2002
	Average Annual Total Inflows, $ billion				
1	China, People's Rep. of	6.3	1	China, People's Rep. of	46.8
2	Singapore	4.2	2	Hong Kong, China	33.1
3	Malaysia	3.9	3	Singapore	10.4
4	Hong Kong, China	2.7	4	Korea, Rep. of	4.9
5	Thailand	2.3	5	Taipei,China	3.5
6	Indonesia	1.5	6	India	3.1
7	Taipei,China	1.2	7	Thailand	2.7
8	Korea, Rep. of	0.9	8	Malaysia	2.5
9	Philippines	0.6	9	Kazakhstan	2.2
10	Viet Nam	0.3	10	Viet Nam	1.3
	Total Asia-Pacific	25.2			111.7
	(Percent of World Total)	(14.2)			(11.7)
	Average Inflows per Capita, $				
1	Singapore	1,373	1	Hong Kong, China	4,836
2	Hong Kong, China	471	2	Singapore	2,534
3	Malaysia	213	3	Brunei Darussalam	2,035
4	Vanuatu	140	4	Macao, China	205
5	Fiji Islands	100	5	Taipei,China	156
6	New Caledonia	67	6	Kazakhstan	143
7	Taipei,China	57	7	Malaysia	107
8	Papua New Guinea	47	8	Korea, Rep. of	105
9	Thailand	41	9	Vanuatu	88
10	Solomon Islands	40	10	Azerbaijan	57
	Inflows as Percent of Gross Fixed Capital Formation				
1	Vanuatu	42.8	1	Hong Kong, China	76.1
2	Fiji Islands	37.6	2	Kazakhstan	48.4
3	Singapore	31.0	3	Singapore	44.7
4	Viet Nam	28.4	4	Cambodia	31.6
5	Papua New Guinea	22.7	5	Vanuatu	30.0
6	Malaysia	21.4	6	Armenia	24.7
7	Solomon Islands	20.1	7	Uzbekistan	24.6
8	Cambodia	17.0	8	Georgia	23.7
9	Hong Kong, China	11.5	9	Mongolia	16.3
10	Maldives	8.3	10	Papua New Guinea	14.8

Sources: ADB (2003a), UNCTAD (2004), UN Population Division (2004).

Distinguishing characteristics of FDI are its stability and ease of service relative to commercial debt or portfolio investment, as well as its inclusion of nonfinancial assets in production and sales processes. Aside from increasing output and income, potential benefits to host countries from encouraging FDI inflows include the following:

(i) *Foreign firms bring superior technology.* The extent of benefits to host countries depends on whether the technology spills over to domestic and other foreign-invested firms.
(ii) *Foreign investment increases competition in the host economy.* The entry of a new firm in a nontradable sector may increase industry output and reduce the domestic price, leading to a net improvement in welfare.
(iii) *Foreign investment typically results in increased domestic investment.* In an analysis of panel data for 58 developing countries, Bosworth and Collins (1999) found that about half of each dollar of capital inflow translates into an increase in domestic investment. However, when the capital inflows take the form of FDI, there is a near one-for-one relationship between the FDI and domestic investment.
(iv) *Foreign investment gives advantages in terms of export market access arising from economies of scale in marketing of foreign firms or from their ability to gain market access abroad.* Besides their contributions through joint ventures, foreign firms can serve as catalysts for other domestic exporters. The probability a domestic plant will export is positively correlated with proximity to multinational firms (Aitken et al. 1997).
(v) *Foreign investment can aid in bridging a host country's foreign exchange gap.*

If both labor and capital are fully employed before and after the capital movement, the total and average returns to capital increase, while total and average returns to labor decrease in the source country. While that country gains as a whole, income is redistributed from labor to capital. Meanwhile, in the recipient country, income is redistributed from capital to labor, as total and average returns to capital decrease and total and average returns to labor increase. The result is potentially a win-win situation for the two countries.

Under full employment, a capital inflow that reduces the relative scarcity of capital and raises the productivity of labor in the host country can raise real wages across the board and reduce income disparity within the host country. However, the question of distribution also arises with respect to the sharing of gains between foreign capital and host countries' factors of production. Traditionally, foreign investment was geared toward primary commodity exports. In some cases, this led to capacity expansion, productivity growth, declining prices of exportable commodities, and deterioration in the host country's terms of trade, possibly leading to welfare losses. In addition, there were generally little spillovers to the rest of the host economy from primary commodity production. The resulting view was that the gains from capital inflows favor the source economy more than the host economy.

Many new foreign investments in developing countries are in process manufacturing because of lower labor costs, such as sports shoe factories across developing Asia. The host countries often import unfinished components and export finished goods or refined components for further processing elsewhere. While wages may rise across the board in host countries and reduce income disparity, in practice wages are likely to rise only for a small fraction of the labor force employed by the foreign investor. By creating a favored local group, this can lead to greater income disparity within the host country. The result can be to improve the absolute and relative condition of workers within this favored group, in the process aggravating income inequality. Over time, however, and given a conducive policy environment, linkages and leakages emerge, creating a country reputation that influences other potential investors.

A capital inflow can lead to a rise in the prices of nontradable goods and services relative to those of imported goods and services. If world demand for the country's exports is perfectly price-elastic, the price of nontradables will rise relative to the price of exports as well. Consequently, the change will affect the returns to factors that are used intensively in either tradable or nontradable sectors. Thus, a capital inflow-induced terms of trade effect may affect real income for any given level of real output, which may or may not be affected. When capital flows to an industry in which an existing firm has monopoly power in the world market, an increase in output from the new competition lowers the price of the exportable, thus reducing the terms of trade and potentially lowering welfare in the host country.

When there are "lumpy" adjustment costs for new investment and there are economies of scale in the investment technology, trade openness can trigger discrete changes in the terms of trade and thereby lead to a discrete jump in the level of investment. However, it can also lead to boom-bust cycles of investment where multiple equilibria are supported by self-fulfilling expectations (Razin et al. 2002).

As foreign investors search for the location that will provide the highest returns on their investment, they are often drawn to countries with abundant natural resources but low-quality institutions. Weak and inefficient institutions allow the extraction of natural resources at a faster pace than that required for sustainable development. As a result, local communities are sometimes harmed as the environment, their main source of livelihood, is damaged or destroyed.

Foreign investment-led growth also promotes western-style consumerism, which could have serious potential consequences on the health and food security of the host population (French 1998).

Not all investments by multinational enterprises (MNEs) lead to technology transfer and positive spillovers. In their desire to protect the technology of the parent company, MNEs may limit the production of affiliates in host countries to low value-added activities, thereby reducing the scope for technical change and technological learning. The MNEs may also restrict vertical integration by relying completely on foreign suppliers for their inputs. In some cases, MNEs, by their sheer size, can even eliminate competition by crowding out domestic producers. As integral parts of global value chains, MNEs have a built-in advantage (e.g., economies of scale and scope) over their local competitors.

Increasing FDI across borders has increased the impact of FDI on national economies and the international economy as a whole, with the widely held perception in Asia that the net effect is positive. However, no absolute consensus on the positive effects of FDI has been reached by all governments or the general public, reflecting differences in economic conditions, specific histories of utilizing FDI, cultural variation, and ideological differences. In particular, the policy framework plays an important role in determining the effects of FDI on a recipient country.

B. Bilateral Investment Treaties

In the international context, bilateral investment treaties (BIT) have proliferated. By the end of 2002, there were 2,181 BITs and 2,255 double taxation treaties in effect (UNCTAD 2003). These BITs vary across countries but generally contain binding commitments on expropriation, transfer of funds, and compensation due to armed conflict or political instability. These commitments are sometimes provided on a national treatment or most favored nation (MFN) basis.[1] Disagreements between foreign investors and the host government are usually referred to private arbitration centers of the International Chamber of Commerce or the International Centre for Settlement of Investment Disputes.[2]

Bilateral investment treaties are intended to protect foreign investors against unpredictable host country actions that would negatively affect the profitability of their investments. In this sense they guard against problems of dynamic inconsistency. However, their implementation may not always be effective in lower-income countries. Furthermore, their benefits for the host countries are not clear. Empirical evidence has not found a strong link between the existence of a BIT and an increase in FDI flows. Furthermore, BITs complement, rather than substitute for, institutional quality, including strength of property rights (Hallward-Dreimeier 2003). Tax treaties may even reduce FDI if the FDI includes an element of tax evasion. At the same time, BITs may reduce policy options for the host country government and leave it open to being sued for substantial amounts. Decisions handed down behind closed doors by the arbitration panels, which have no public accountability, cannot be amended by the domestic legal system.

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[1] In the context of international trade and investment negotiations, MFN treatment obliges the host country to offer equally advantageous investment conditions to potential investors from all treaty signatories. National treatment (nondiscrimination) requires the same treatment of both foreign and domestic investors.

[2] While private sector arbitration mechanisms have generally worked satisfactorily so far, it raises the potential for political disagreements in that a sovereign judicial system can be overruled by an arbitration panel that is unelected and usually operates with little transparency.

Despite the possible asymmetry of BITs' benefits for foreign investors and host economies, these agreements have proliferated. By the end of December 2002, the PRC had signed bilateral agreements with 107 countries on protection of investment, and with 75 countries on taxes; India had signed 46 bilateral investment promotion and protection agreements. As some developing economies mature and their outward FDI flows increase, as in the case of Korea, they become more interested in protecting the rights of their investors. In the broadest international context, this has led to calls for a multilateral framework on investment.

The Trade-Related Investment Measures (TRIMs) Agreement in the World Trade Organization (WTO) recognizes that certain investment measures distort trade and that these distortions are not consistent with principles of the General Agreement on Tariffs and Trade (GATT). Export subsidies, import entitlements, minimum export requirements, and local content requirements directly affect volumes and prices of imports and exports, and in some cases the composition of trade. Local content requirements mean that imports are treated less favorably than domestic inputs, violating the GATT's national treatment principle. A trade-balancing requirement that limits the quantity of imported products that can be used if an MNE does not meet its export target also violates national treatment obligations. Incentives geared to attracting FDI, such as tax incentives, may influence trade flows by persuading firms to favor FDI over exports as a method of foreign market penetration.

All developing countries were to have implemented the TRIMs Agreement and eliminated their relevant regulations by 1 January 2000. Twenty-six developing country members with widely varying economic characteristics gave notice that at that time they still had a variety of policies in existence, however. Most of the policies related to the auto industry or the agro-food industry. The policies overwhelmingly adopted by these countries were local content schemes. The second most frequently notified type of TRIM was foreign exchange balancing requirements (Bora 2001).

In Malaysia, for example, TRIMs Agreement compliance was only completed at the end of 2003 with the removal of its local-content policy on motor vehicles for both new and existing firms. Local content requirements are also being phased out in Viet Nam as part of its moves toward WTO accession. Meanwhile, compliance with the TRIMs Agreement was instrumental in overcoming resistance to investment policy reform in Thailand, as TRIMs were gradually abolished.

A number of countries requested extensions of the TRIMs Agreement transition period. Argentina, Malaysia, Philippines, and Thailand cited financial crises that added to their structural adjustment problems as a major factor behind their extension requests. Colombia and Pakistan cited specific development reasons for their extension requests. Colombia detailed difficulties in transforming its economy, especially in terms of developing substitutes for illegal crops, arguing that this would require domestic absorption, or local content policy, to ensure that farmers are able to sell their produce. Pakistan argued that opening its economy to import competition rapidly would not allow it to exploit domestic resources optimally, to promote the transfer of technology, or to promote employment and domestic linkages. Another reason cited for an extension request was inconsistency between preferential trade agreements and multilateral obligations (Bora 2001).[3]

Bora (2001) also summarizes a few other areas where confusion might arise. The TRIMs Agreement covers measures related to foreign investment according to their impact on trade. However, since nothing in the TRIMs Agreement suggests that the nationality of the ownership of enterprises is an element in deciding whether that measure is covered by the Agreement, the TRIMs Agreement is not confined to policies targeting foreign firms. It is in fact ownership-neutral. However, some argue that the TRIMs Agreement is basically designed to govern and provide a level playing field for foreign investment, and that therefore measures relating to internal taxes or subsides cannot be construed to be trade-related investment measures.

The current TRIMs Agreement relies on the state-to-state mechanisms of the WTO for dispute settlement and arbitration under which, for example, a dispute settlement panel is established and makes its judgment. Some argue that it is necessary to establish investor-to-state mechanisms to ensure investors receive a hearing (Moran 2002). Others believe inclusion of an investor-to-state dispute settlement mechanism would add an excessive burden on developing countries' legal machinery and imposes a threat to their national sovereignty (Tangkitvanich et al. 2004). Korea's preliminary position is that the dispute settlement of the multilateral framework for investment should not cover investor-to-state disputes.

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[3] Argentina's request stated specifically that negotiations within the context of the MERCOSUR Common Automotive Policy were important. Mexico did not specifically mention NAFTA in their request, but it has been noted that there is an inconsistency in the phase out period for TRIMs between NAFTA and the WTO.

More fundamentally, several developing countries are of the view that TRIMs and other investment measures are domestic investment issues that should therefore not involve WTO officials. This point was emphasized during the Fifth WTO Ministerial meeting in September 2003. India and others also assert that the mandate of the WTO is confined to trade and does not extend to investment. Some fear they would be deprived of a major means of exercising control over foreign firms operating locally if their right to impose TRIMs or other investment measures were removed. Some developing countries, including India and Malaysia, consider that policies such as domestic content requirements are essential policy tools for industrialization. At the WTO Doha Ministerial Conference, a number of countries stated that joint venture requirements encourage indigenization. They believe developing countries should be allowed to use TRIMs and other investment measures flexibly in pursuit of developmental objectives because each country's unique needs and circumstances require sufficient freedom and flexibility to pursue one's own policies. They are of the view that, although the TRIMs Agreement established uniform obligations for all members, it does not take account structural inequalities and disparities in levels of development, technological capabilities, or social, regional, and environmental conditions; and does not incorporate a meaningful development dimension. A legally binding treaty on foreign investment would reduce the degree of flexibility available (Ganesan 1998).

In a joint submission with Brazil to the WTO's Committee on TRIMs in October 2002, India argued that the TRIMs Agreement should be amended to incorporate provisions that provide developing countries flexibility to implement development policies. In particular, they proposed that developing countries should be allowed to use investment measures or performance requirements to promote domestic manufacturing capabilities in high value-added sectors, to stimulate the transfer and indigenous development of technology, promote domestic competition, and correct restrictive business practices (Kumar 2004). Despite its increasing trend of investment abroad, Malaysia also views multilateral rules on investment as impinging on development policy options and has called for clarification of the issues before negotiations commence (Tham 2004).

Conventional wisdom holds that developing countries engage in trade-distorting investment measures while developed countries do not. However, trade and investment figures clearly show that developed countries also use investment measures. Most developed countries make available location-based incentive packages for both domestic and international investors. Ireland reports that its special incentive packages have attracted more than 1,200 foreign firms to its economy, and these contribute 70 percent of the country's industrial output and three quarters of its manufactured exports (O'Donovan 2000). German grants to both domestic and foreign firms to settle in the economically depressed former East Germany have exceeded the already generous treatment EU member states used to attract investment to regions lagging behind. The Organisation for Economic Co-operation and Development (OECD) found that almost 90 percent of all domestic support programs in the EU were available to foreign investors (OECD 1996, Moran 2002). Any multilateral effort to create a level playing field for national and international companies among home and host countries around the world would be seriously deficient if it ignored the proliferation and escalation of location-based incentives by developed countries.

II. FDI REGIMES AND PATTERNS IN SIX ASIAN ECONOMIES

Having surveyed general patterns and issues, this section assesses FDI inflows (and outflows), patterns, and policy regimes in six diverse Asian countries, namely PRC, India, Korea, Malaysia, Thailand, and Viet Nam, in the context of general economic trends, ownership structures, and policy reforms. A central argument is that trade reform alters production incentives for the domestic market relative to exports, resulting in a fundamental shift in the behavior of MNEs and in the FDI cost-benefit calculus.

A. Six Diverse Economies

Tables 2 and 3 present comparative statistics for the six economies, including some general economic indicators, as well as those relating to the trade regime and FDI. Also included are some indicators of the countries' attractiveness to foreign direct investment. Table 4 offers some summary stylized facts of FDI regimes.

The sample includes the world's two most populous nations, together with a range of intermediate-sized countries with populations in the range of 20-100 million people. The largest economy (the PRC) is more than double that of the next largest (India) and about 35 times that of the smallest (Viet Nam). Korea is a rich OECD member. Malaysia is an upper middle-income developing country. The PRC and Thailand are in the lower middle-income group, while India and Viet Nam are low-income. The range of per capita GDP from the richest (Korea) to poorest (Viet Nam) is about 30:1, or 7:1 in purchasing power parity terms.

All six have performed creditably for most of the past two decades. Their real per capita incomes in 2002 were at least double those of 1980, and more than five times higher in the case of the PRC. Since 1990, the PRC has consistently recorded spectacular economic growth, to the point where it is now the principal East Asian growth locomotive, and a major global economy. If its current growth rates are maintained, it will become the world's largest economy (in purchasing power parity terms) before 2020. Korea, Malaysia, and Thailand all grew at more than 6 percent until the crisis of 1997-1998; Thailand was the world's fastest growing economy in the decade from the mid-1980s. All three experienced a sharp contraction in 1998, but recovery has been fairly rapid. Viet Nam grew strongly for most of the 1990s, with slower (but consistently positive) growth during the crisis. India has never consistently achieved the very high growth rates of the others. However, reforms from the late 1980s have lifted its performance significantly, and it was largely unaffected by the recent Asian crisis.

All six have reasonably good macroeconomic management. Since 1990, all have averaged single-digit inflation. None is a heavily indebted economy. Malaysia and Thailand have the highest debt to GDP ratios. Both were running very large current account deficits precrisis, albeit in the context of very high investment rates, low fiscal deficits, and (owing to their outward orientation) moderate debt-service ratios.

B. Foreign Direct Investment Regimes

1. An Overview

In their FDI regimes, it is useful to divide the six countries into three groups. The first comprises those with historically very restrictive regimes, including outright prohibition, which have opened up during the past quarter century. This includes PRC, India, and Viet Nam. Second are those that have always been reasonably open, and become progressively more so. Malaysia and Thailand belong to this group. Finally, there is the special case of Korea, which was initially highly selective in its opening up to FDI, and which has become progressively more open, especially in the 1990s. There is no instance in our sample of countries becoming less open toward foreign direct investment.

The comparative FDI data reported in Table 3 illustrate these general characterizations. In 1990, Malaysia, the least populous of the six, had the largest stock of FDI after the PRC. Thailand was well ahead of the other three. The amount in Viet Nam was negligible. By 2002, the PRC had emerged as the dominant recipient, with more than seven times the stock of the next two, Malaysia and Korea. In 2002, it was the world's largest FDI recipient, overtaking the United States. India and Viet Nam still had the smallest stocks, though they had both increased quickly, especially Viet Nam. Relative to GDP, Malaysia was the largest recipient of FDI in both years, and India the smallest. The greatest absolute increase in these ratios occurred in Viet Nam, followed by Malaysia.

Table 2. **Annual Inflows of FDI, Portfolio, and Other Capital, 1990-2003 ($m)**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
PRC														
Total Capital Inflows	n.a.	9,431	7,467	30,585	36,214	41,676	43,834	64,107	35,230	41,908	58,045	41,557	50,031	n.a.
FDI	3,487	4,366	11,156	27,515	33,787	35,849	40,180	44,237	43,751	38,753	38,399	44,241	49,308	n.a.
Portfolio	n.a.	565	393	3,646	3,923	710	2,372	7,842	98	-699	7,317	1,249	1,752	n.a.
Other	1,070	4,500	-4,082	-576	-1,496	5,116	1,282	12,028	-8,619	3,854	12,329	-3,933	-1,029	n.a.
India														
Total Capital Inflows	n.a.	4,258	3,147	5,244	9,488	5,157	16,798	14,490	11,871	10,108	11,506	7,940	3,764	n.a.
FDI	n.a.	74	277	550	973	2,144	2,426	3,577	2,635	2,169	2,657	4,334	3,030	n.a.
Portfolio	n.a.	5	284	1,369	5,491	1,590	3,958	2,556	-601	2,317	2,774	2,041	967	n.a.
Other	6,139	4,180	2,587	3,325	3,024	1,423	10,413	8,357	9,837	5,623	6,075	1,566	-234	n.a.
Korea														
Total Capital Inflows	6,950	11,087	11,527	10,222	23,156	37,845	48,412	7,835	-7,681	18,744	20,713	4,106	12,449	n.a.
FDI	788	1,180	728	589	810	1,776	2,326	2,844	5,412	9,333	9,283	3,528	1,972	n.a.
Portfolio	662	2,906	5,875	11,088	8,713	14,619	21,514	13,308	775	7,908	12,697	12,227	4,940	n.a.
Other	5,500	7,001	4,924	-1,455	13,632	21,450	24,571	-8,317	-13,868	1,502	-1,268	-11,650	5,538	n.a.
Malaysia														
Total Capital Inflows	1,989	4,664	7,244	11,738	784	6,628	5,343	6,801	2,719	n.a.	n.a.	-942	4,235	n.a.
FDI	2,332	3,998	5,183	5,006	4,342	4,178	5,078	5,137	2,163	3,895	3,788	554	3,203	n.a.
Portfolio	-255	170	-1,122	-709	-1,649	-436	-268	-248	283	-892	-2,145	-666	-836	n.a.
Other	-89	496	3,183	7,441	-1,909	2,885	533	1,912	272	n.a.	n.a.	-830	1,868	n.a.
Thailand														
Total Capital Inflows	9,402	11,575	9,517	13,998	13,691	25,534	17,797	-8,851	-10,591	-8,970	-8,094	-3,530	-6,003	-6,140
FDI	2,444	2,014	2,113	1,804	1,366	2,068	2,336	3,895	7,315	6,103	3,366	3,892	953	1,800
Portfolio	-38	-81	924	5,455	2,486	4,083	3,585	4,598	338	-109	-546	-525	-694	356
Other	6,996	9,642	6,479	6,739	9,839	19,383	11,876	-17,344	-18,243	-14,964	-10,914	-6,897	-6,263	-8,296
Viet Nam														
Total Capital Inflows	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	2,942	2,237	2,183	1,844	1,773	1,568	1,466	n.a.
FDI	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	2,395	2,220	1,671	1,412	1,298	1,300	1,400	n.a.
Other	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	547	17	512	432	475	268	66	n.a.

Source: IMF (2004b).

Table 3. **Comparative Statistics**

	PRC	India	Korea	Malaysia	Thailand	Viet Nam
General Economic Indicators						
GDP 2002 ($ billion)	1,237	515	477	95	126	35
GDP per capita PPP 2002 ($)	4,475	2,571	16,465	8,922	6,788	2,240
GDP per capita growth (1990-96) (%)	9.2	3.7	6.5	6.7	7.4	5.8
GDP per capita growth (1997-2002) (%)	6.9	3.5	3.9	0.8	0.0	5.1
Annual average inflation (1990-2002) (%)[a]	6.5	8.3	5.1	3.2	4.1	3.1
Total external debt/GDP 2002 (%)	13.3	20.5	27.1	51.2	46.7	38.0
GDP per capita 2002/GDP per capita 1980[b]	5.6	2.2	3.7	2.1	2.7	2.2
Openness						
Trade						
(Exports+Imports)/GDP 1990 (%)	31.9	15.7	59.4	147.0	75.8	81.3
(Exports+Imports)/GDP 2002 (%)[c]	52.2	31.3	78.6	210.1	122.3	111.5
Export growth (1990-2002) (%)[d]	16.6	12.5	13.6	10.7	9.9	25.6
Average tariff rate 1999	18.7	30.2	7.9	8.1	5.9	20
Index of Economic Freedom (2003)[e]	3.6	3.5	2.7	3.2	2.9	3.9
Investment						
FDI as % of total capital inflows 1990-96[f]	93	15	7	147	16	81
FDI as % of total capital inflows 1997-2002[g]	93	38	27	43	-58	84
Total cumulative FDI inflow, 1990-2002 ($ billion)	425.0	24.3	40.6	55.7	40.1	17.0
Total FDI stock, 1990 ($ billion)	24.8	1.7	5.2	10.3	8.2	0.3
Total FDI stock, 2002 ($ billion)	447.9	25.8	43.7	56.5	30.2	17.1
Outflow / inflow FDI stock 1990 (%)	10.1	16.8	39.2	25.9	4.9	0.0
Outflow / inflow FDI stock 2002 (%)	7.9	9.7	99.6	35.7	9.0	0.0
Total FDI stock as % of GDP, 1990	7.0	0.5	2.3	23.4	9.6	4.0
Total FDI stock as % of GDP, 2002	36.2	5.1	9.2	59.4	23.9	50.3
FDI as % of GDP, 1990-2000 (annual average)	4.1	0.4	0.8	6.4	2.2	6.6
Human Capital						
Years of education, 2000[h]	5.7	4.8	10.5	7.9	6.1	3.8
Tertiary enrolment as % of age group, 2000[i]	7.5	10.5	77.6	28.2	35.3	9.7
R&D expenditure as % of GDP, 2000[j]	1.0	1.2	2.7	0.4	0.1	n.a.
Number of internet users as % of total population, 2001	2.6	0.7	51.5	27.3	5.8	1.3
Public spending on education as % of GDP, 2000[k]	2.9	4.1	3.8	6.2	5.4	2.8

continued.

Table 3. *continued*

Physical Infrastructure[l]	**44**	**56**	**18**	**29**	**32**	**60**
Institutional Quality & Risk						
Corruption (Corruption Perceptions Index, 2003)[m]	3.4(66)	2.8(83)	4.3(52)	5.2(37)	3.3(75)	2.4(105)
Country risk (composite risk rating, 2001)	74.3	65.3	79.3	76.0	73.8	69.5
Property rights index, 2003[n]	4	3	2	3	3	5
Bureaucratic quality (Public Institutions Index, 2003)[o]	4.33(52)	4.26(55)	5.03(36)	5.12(34)	4.97(37)	4.11(61)
Fiscal/Finance						
Stock market capitalization, 2002[p]	13	23	43	129	37	n.a.
Average corporate tax rate, 1999 (%)	33	35	28	28	30	25

Notes: [a] Data for the PRC are for the period 1990-2001 and for Viet Nam, 1996-2002.

[b] Data for Viet Nam are for 1984 and 2002.

[c] Data for Viet Nam are for 2001.

[d] Data for Viet Nam are for the period 1990-1997.

[e] Index of Economic Freedom ranges from 0 (mostly free) to 5 (highly restricted).

[f] Data for PRC and India refer to the period 1991-1996; for Viet Nam, 1996.

[g] Data for Malaysia for 1999 and 2000 are missing.

[h] Average years of schooling of population aged 25 and over. Data for Viet Nam are for 1990.

[i] Tertiary enrolments (regardless of age) as percentage of 20-22 age group. Data for the PRC and India are for 1999.

[j] Data for India, Malaysia, and Thailand are for 1996, 1998, and 1997, respectively.

[k] Data for India and Viet Nam are for 1999 and 1997 respectively.

[l] Growth Competitive Index, 2003, 1-102 ranking, 1=best.

[m] The index ranges from 10 (highly clean) to 0 (highly corrupt) for 133 countries. The maximum is 9.7 and the minimum 1.3. Numbers in parentheses are the country rankings.

[n] The property rights index is a composite from the Index of Economic Freedom. This index ranges from 0 (very good) to 5 (very poor).

[o] The public institutions index is based on survey data and ranges from 2.28-6.56 across 102 countries. The higher the index the higher the quality. Numbers in parentheses are the country rankings.

[p] Data for India are for 2001.

Sources: Barro and Lee (2000), IMF (2004b), Miles et al. (2004), Transparency International (2003), UNCTAD (2002 and 2003), World Bank (2003), World Economic Forum (2003).

Table 4. **FDI Regimes—Some Stylized Facts**

	PRC	**India**	**Korea**	**Malaysia**	**Thailand**	**Viet Nam**
Ownership Structures	Dominant but declining SOEs, rapidly rising private and foreign firms	Large SOE sector; reservations schemes for small firms	Predominantly private; *chaebol* important; high concentration; small SME presence	Always large foreign presence; active *bumiputra* promotion	Predominantly private; Sino-Thai dominance	Dominant SOEs, actually rising post reform
FDI History	Closed to 1978; rapid increase from 1980s, especially in south	Very restrictive pre-1991, then gradual opening	Restrictive until 1990s; then gradual opening; major 1998 reforms	Consistently open	Consistently fairly open	Closed to late 1980s; rapid rise from early 1990s
FDI Presence	Modest but rising	Modest, no clear trend	Low, rising gradually	Very high	Substantial, and rising	Low, but rising quickly
Trade Regime	Closed to 1978; then progressive opening, especially for exports; 2002 WTO accession	Very restrictive pre-1991, then gradual opening	From 1960s, open for exports, otherwise restrictive; major 1990s reforms	Consistently open	Consistently fairly open	Closed to late 1980s; then major opening, especially for exports
International Connections	Hong Kong, China important; large diaspora	Large and active diaspora	Large US diaspora; reverse brain drain in 1990s	Singapore ties historically strong	No special features	Large diaspora, still regarded with suspicion
FDI Regime in Practice	Continuing though declining SOE preference; rapid decentralization; much corruption	Reforming, in context of dirigiste history; states are powerful; much corruption	Business climate becoming more predictable and open; powerful nationalist sentiment	Predictable commercial environment	Reasonably predictable commercial environment	Continuing SOE preference; north-south differences; private firms insecure
Institutional Quality	Uneven, though improving	Well developed, though cumbersome	Generally high, though legal system still evolving	Generally high	Generally quite high	Weak; very limited investor protection
Human Capital	Pockets of excellence; uneven, rapid catch-up	Pockets of excellence; continuing high illiteracy	Extremely strong education; R&D base, though not very international	Generally quite good; major affirmative action program; continuing non-*bumiputra* brain drain	Historic under-investment in post-primary education	High literacy, though limited international commercial know-how and entrepreneurship

Note: SOEs means state-owned enterprises.

In some cases, it is possible to date the opening up to FDI as part of a package of major general reforms. In Korea, there was gradual liberalization from the late 1980s, with major reforms in 1997-1998 in the wake of the economic crisis. In the PRC the reform process commenced in 1978. It was further consolidated in the late 1980s, and again in 2002 upon accession to the World Trade Organization. In India, 1991 is regarded as the key reform year. In Viet Nam it was the late 1980s' *Doi Moi* reforms, with further liberalizations around the turn of the century.

By contrast, Malaysia especially and Thailand have always been quite open to FDI, and over time have become progressively more so. In neither case have there been major swings in the policy pendulum. In the decade up to the 1997 crisis, Thailand was a huge capital importer, in some years running a current account deficit of more than 8 percent of GDP. While FDI increased to record levels, an increasing proportion of the flow was portfolio and other short-term capital. The government's objective to promote Bangkok as a regional capital market center in competition with Hong Kong, China and with Singapore was a factor here, as virtually all restrictions on capital flows were removed. Following the 1997-1998 capital flight and consequent collapse of the baht, the government maintained its open posture toward FDI, despite a growing nationalist backlash, and FDI flows actually increased for a period.

In Malaysia, the principal ownership issue has arguably been the political imperative to redistribute toward the indigenous (bumiputra) community (Gomez and Jomo 1997), rather than the foreign presence per se. Under the New Economic Policy (NEP), announced in 1970, the bumiputra share of the corporate sector was to rise from 2 to 30 percent. Reaching about 20 percent in 1990, albeit through sometimes controversial share allocations, the scheme has been somewhat deemphasized, especially in the wake of the mid-1980s recession and the economic crisis of 1997-1998. In fact, the very high foreign presence at the outset of the NEP facilitated this transformation, as the major redistribution occurred not from non-bumiputra to bumiputra groups but rather from foreign to domestic. The non-bumiputra share actually rose throughout the period, while the foreign share fell continuously until recently.

This is not the place to analyze in any detail the dynamics of these reforms and why they took place. But it is worth pointing out that a range of internal and external factors were typically at work. At an intellectual level, these factors include a recognition that outward-oriented economies grow more quickly, and that it is possible to achieve "nationalist" objectives in an open economy context. Competitive liberalizations—keeping up with one's neighbors—have been a factor. Foreign pressures, including a desire to join international agencies (the GATT/WTO and, for Korea, the OECD) have often coaxed countries along. Conversely, the demise of an international benefactor (the former Soviet Union) was a major trigger in Viet Nam's reforms. Coalitions of key bureaucrats and political figures have often accelerated progress once the environment for reform was judged to be favorable.

Obviously, "policy reform" has very different connotations across the six. In traditionally open Malaysia and Thailand, it has implied a gradual shift of the pendulum. In other cases, reform has constituted a major change in policy emphasis, even a U-turn, in which FDI liberalization has been important. The PRC and Viet Nam are both cases of a transition from a prohibitive to a quite open FDI regime.

2. "Dual Policy" Regimes

While FDI regimes have become more open among the six, there remains considerable selectivity across sectors and firms. Governments have typically been slower to open up the services sector to foreign direct investment. All countries have "national projects" where a range of noneconomic considerations intrude. Among the sample, for example, even the most open economy, Malaysia, has consistently protected its uneconomic automotive industry, and restricted foreign equity participation in it.

More generally, countries typically have a mix of both "rent-seeking" and "efficiency-seeking" FDI, reflecting partial reform of their trade regimes, and the political economy of dispensing patronage. Consequently, all the country studies draw attention to what may be termed "dual policy regimes." For example:

(i) Foreign direct investment policy may differ between regions. Three of the six (PRC, India, Malaysia) feature quite high levels of decentralized economic policymaking. Thailand has been pursuing a policy of "industrial decentralization" for some time. In all but Malaysia, economic authority is being progressively devolved away from the center in varying degrees and speed.

(ii) There are large interindustry differences in protection, and thus incentives, in all six.

(iii) State-owned enterprises (SOE) typically receive preferential treatment, especially in PRC, India, and Viet Nam, and so therefore do their MNE joint venture partners.

(iv) Most countries offer some sort of fiscal or financial incentives to foreign investors. These vary by sales orientation, technology introduced by the foreign investor, location of investment, and other factors.

(v) The regulatory regime frequently offers more than one entry option for potential foreign investors, especially in recently reformed economies.

Not surprisingly, this phenomenon of dual policy regimes is particularly pronounced in the most recently reformed economies, the PRC and Viet Nam. On one hand, there is FDI flowing into joint ventures with SOEs, often in protected, uneconomic sectors, possibly producing negative value added at international prices. Foreign direct investment also typically flows into nontradables such as real estate and hotels where, in thin markets for international-quality assets, asset-price bubbles may occur. Meanwhile, another group of foreign investors enters "comparative advantage" sectors (SMEs, labor-intensive, export-oriented activities). Often the latter locate in special zones that are free of the regulatory and bureaucratic complexities found elsewhere in the economy. Thus, for example, the PRC's initial export orientation was confined to the four southern coastal zones. Most of the labor-intensive FDI originated from Hong Kong, China, and later Taipei,China. This FDI co-existed with that going into joint ventures with SOEs, much of it in uneconomic and protected heavy industry. Firms from OECD countries were the dominant investors in these cases. The domestic welfare implications of different types of FDI are fundamentally important. Clearly, therefore, there is not a single "FDI model" in these economies. A major feature of the reform process is the diminished importance of the former type of FDI, as the latter becomes progressively more important.

Even among the relatively successful late reformers, policy progress is invariably uneven and unpredictable, as is the response of investors. Viet Nam in the 1990s illustrates both these propositions. Following Doi Moi, growth accelerated and there was an initial period of euphoria among foreign investors. By the mid-1990s, however, foreign investors became more wary as the reality of doing business in a transitional, partially reformed communist state sank in (see Freeman 2003). The prolonged commercial isolation and prevailing ideology permeating much of the bureaucracy and the Communist Party meant that policymakers frequently had very little understanding of how to manage a foreign commercial presence. Moreover, many of the general problems associated with the business environment had not been addressed in the first round of reforms: red tape, corruption, insecure property rights, ill-defined legal environment, poor physical infrastructure, limited financial development; and the huge, inefficient, and privileged SOE sector. Finding private sector business partners was difficult, especially as much of the non-SOE business sector was either neglected or harassed.

The PRC is an excellent illustration of the political economy proposition that, in some circumstances, partial reform is desirable if it can be a precursor to successful economywide liberalization. Evidently, the latter was not politically feasible during the early years of reform. As the coastal zones began to grow at a spectacular rate, they became the model for the rest of the economy to emulate, and reform progressively extended to other regions and sectors (Lardy 1996).

3. Reform—Rhetoric versus Reality

In any evaluation of policy regimes, it is crucial to distinguish between formal FDI and trade regimes, and their operation in practice. Nominally "open" regimes may in fact be highly complex and corrupt. Widespread physical and technical smuggling and unrecorded capital flows are present in all six, especially the less reformed ones. For example, smuggling renders irrelevant much of Viet Nam's formal trade regime. The value of investment incentives is significantly eroded by administrative complexities and corruption.

Reform at the center does not necessarily ensure that liberalization will proceed smoothly. This is illustrated in the case of India, where power is diffused and the vested interests and philosophical predisposition toward planning and intervention built up during decades of dirigisme cannot be quickly overturned.[4] Under India's federal structure, the states wield considerable power. Moreover, while the reforms have been "positive sum game", since growth has accelerated, there have been losers: among the bureaucrats who dispensed power and patronage, the SOEs sheltered from competition, and the unions in feather-bedded (especially state-owned) industries.

In Korea, too, there seems to have been considerable ambivalence about recent reforms in sections of the bureaucracy that are reluctant to relinquish control. Considerable sectoral restrictions on FDI remain, while business surveys report that foreign investors find the business environment quite difficult. To overcome these difficulties, reformers have proposed the establishment of "free economic zones", where liberalization can proceed more quickly than elsewhere. Partial reforms of this nature illustrate the strength of the opposition to continuing reform.

One general lesson from the reform experience is that authoritarian states like the PRC and Viet Nam can reform very quickly, once key leadership figures are convinced of the case for change. Democratic states such as India invariably move more slowly. Conversely, it may be that the reforms are likely to be more durable in democratic states: greater persuasion is required to get the reforms through, potential losers are more likely to be compensated, and therefore opposition ameliorated.

Frequently, the investment boards charged with regulating FDI have little general authority. "One-stop-shops" may simply refer to their operations and not the regulatory complexities of many other, more powerful agencies. Moreover, the rationale for these boards continues to be ill-defined. Over a decade ago, there was

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[4] To quote Joshi (2003, 565): "In practice, however, the system [i.e., the FDI regime] is more restrictive than it sounds, because there still remain numerous hurdles to jump, erected by State governments if not the Centre." Athreye and Kapur (2001, 422) note that the irony that "...even in sectors where foreign investment is readily allowed, firms must secure 'automatic approval'!" On the Indian reforms, see also Joshi and Little (1997) and Krueger (2002).

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concern in the literature over how Asian investment boards married their (potentially conflicting) promotion and regulatory functions.[5] Such a concern appears to be even more valid today, in the wake of the transition to outward orientation, and the region's economic crisis (Buckley 2003).

Especially in larger states, subnational policy regimes matter increasingly. In well-established federal structures like those of India and Malaysia, states do compete for investment, and the division of fiscal and regulatory responsibilities between them and the center is reasonably clear. But decentralization is proceeding rapidly in most of East Asia's nominally unitary states (Hill 2002). Regional authorities are now offering a range of incentives, some only quasilegal. The general presumption is that this intranational competition for FDI (and investment in general) is desirable, since it will spur improvement of quality of governance at the local level. However, there are dangers, especially moral hazard concerns of local governments offering excessively generous incentives secure in the knowledge of central government bail-outs. Moreover, as international barriers to commerce are declining, paradoxically subnational barriers are sometimes rising.

C. Ownership Structures and Foreign Presence

Rising FDI flows in the six economies have generally been associated with an increased foreign presence, as measured by MNE shares of output, employment, and exports. However, it needs to be emphasized that rising FDI inflows do not necessarily result in increasing foreign ownership (see Ramstetter 1999). This is so for a number of reasons. First, especially in high-growth economies, increased FDI flows have been accompanied by rising domestic investment rates, and thus the share of foreign-owned firms has not necessarily risen. Second, much FDI takes the form of reinvested earnings rather than capital inflow, especially in countries such as Malaysia with a long established foreign investment presence.

More generally, the foreign presence is always recorded imperfectly. Foreign direct investment flows are poorly recorded. Disaggregated FDI flow data by sector and source country are mostly incomplete. Accurate stock estimates of the foreign presence are rarely available, while census statistics on foreign ownership are irregular and patchy. Data on other dimensions of foreign presence (e.g., portfolio investments, some of which may be "FDI-like"; licensing and franchising; human capital flows) are even weaker. Moreover, the nationality of ownership is often an empirically slippery concept, especially where there exist large diaspora communities abroad. These are present in all six countries, particularly PRC, India, and Viet Nam.

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[5] See Wells and Wint (1991). In their sample of countries, only Singapore appeared to have an effective separation of responsibilities.

Bearing these caveats in mind, it is useful to briefly highlight some salient ownership patterns in the six countries.

Accurate economywide ownership data are not available for the PRC. The best documented sector is manufacturing, where the major ownership feature has been the rapidly diminishing importance of the once dominant SOE sector (Garnaut and Song 2003). Its share of industrial output declined from 49 percent in 1994 to just 18 percent in 2001. Over this period, shares of the non-SOE domestic sector and foreign firms rose by approximately similar amounts: 38 to 53 percent for the former, and 13 to 28 percent for foreign firms. Among the latter, firms from Hong Kong, China; Macao; and Taipei,China account for 40-45 percent of the total. There has been some, but limited, privatization of SOEs. The major change has been the unshackling of the nonstate sector, which has been the source of the country's economic dynamism since the late 1980s.

In India, too, while economywide ownership data are patchy, in contrast to the PRC, all estimates point to minor ownership changes over time and a modest foreign presence. As would be expected, foreign shares declined prior to liberalization, from around 30 percent of industrial output in the early 1970s to about 25 percent in 1990, according to unpublished data from the Reserve Bank of India (RBI) cited by Athreye and Kapur (2001). These figures overstate the foreign presence since they refer only to medium and large public companies RBI surveyed. As Athreye and Kapur (2001, 409) note, the decline is explained by "...the restrictions placed on foreign firms by the overall regulatory framework. Greater selectivity in industrial licensing restrained the growth of many multinationals [which] were unable to compete against well-organized domestic industrial lobbies." Post-liberalization, this trend appears to be slowly reversing. For listed companies on the Indian stock exchange—a data series that cannot be directly compared with the source above—the share of foreign firms in manufacturing output has risen gradually toward the end of the century: 9.5 percent in 1990, 9.3 percent in 1995, and 12.8 percent in 2000. It could be that the foreign presence has risen more sharply in other sectors, especially the newly opened service industries. The foreign presence in India's manufactured exports is miniscule, especially compared to East Asian norms.

Foreign presence has always been modest in Korea. Within manufacturing, at the onset of the economic crisis, foreign firms produced about 10 percent of manufacturing output and employed 5.5 percent of the industrial workforce. Liberalization and M&A activity raised these shares to 13.3 and 8 percent respectively by 1999. Over the period 1997-1999, foreign firms accounted for about 15 percent of the country's manufactured exports.

The Malaysian data confirm the historically large foreign presence in the economy. Foreign firms owned approximately one third of the nation's share capital in 1999, down from over one half in 1970. Within manufacturing, foreign firms generated about 44 percent of value added and 38 percent of employment in 2000. They also accounted for 73 percent of manufactured exports and 65 percent of total exports in 1995.

Ownership statistics for Thailand are the weakest of the six countries. There are no economywide estimates, while even for manufacturing the first reasonably comprehensive data were prepared only in 1996. They report that firms with a foreign presence (i.e., a foreign share greater than zero) produced about 50 percent of the country's industrial output and employed 41 percent of its workforce. Estimates for 1999 suggest little change in the immediate aftermath of the crisis.

Ownership structures in Viet Nam are unusual. As FDI flowed in from the late 1980s, the share of the SOE sector actually increased. The explanation is that the SOEs retained their privileged access to secure land titles and the domestic banking sector for much of the reform period, and thus many foreign investors were forced into joint ventures with them. Meanwhile, the policy regime suppressed the emergence of a domestic SME sector (Freeman 2003). This trend began to reverse slowly, as the monopoly privileges of SOEs have been eroded. One important milestone in this respect was the granting of 100 percent foreign ownership in certain circumstances (principally for firms in export zones), and the formal recognition that foreign firms are no longer part of the "state capitalist" sector. Another was the passing of the Law on Enterprises in 2000, which provided a more secure environment for the domestic private sector. Over the period 1995-2001, there were no major changes in economywide output shares by ownership, apart from a doubling of foreign firms (6 to 13 percent). The state sector remained virtually constant (39-40 percent), while collectives (10 to 8 percent) and the private/household sector (39 to 36 percent) declined slightly. The small mixed sector remained unchanged (4 percent). In these respects, Viet Nam is yet to experience the far-reaching ownership changes evident in the PRC. The foreign share of Viet Nam's manufactured exports has been rising sharply, from 17-19 percent in 1993-1995 to 57 percent in 2000, emphasizing the importance of FDI in the country's labor-intensive export drive.

D. Flows and Patterns of Foreign Direct Investment

Having drawn attention to differences in ownership patterns among the six, it is also important to draw attention to some common features, and some trends worthy of note. At least five deserve comment.

1. Inflows to the PRC and PRC–India Comparisons

Although the PRC was the world's largest FDI recipient in 2002, the size of the inflows is a subject of debate. The principal uncertainty relates to "round-tripping", that is, the PRC investments are being channelled through Hong Kong, China and returning as "foreign" investment to secure the greater privileges and security that foreign investors typically receive. As the PRC reforms progress, however, and the gap between the commercial environment in Hong Kong, China and adjoining southern regions narrows, this round-tripping FDI appears to be a diminishing proportion of total inflows.

These magnitudes have also triggered a recent debate about the comparative attractiveness of the PRC and India to foreign investors. On the face of it, the PRC appears to dwarf India, owing to its earlier reforms and faster economic growth. Its recorded FDI inflows are about 20 times greater than India's in recent years. However, these reported differences are exaggerated.[6] At least 20 percent of the PRC's FDI is still thought to be round-tripping, while Indian statistics until recently have significantly understated its FDI receipts. In addition, the PRC's economy is about double that of India's. Making these adjustments, the reported 20:1 differential in flows becomes perhaps 3:1 in terms of FDI/GDP ratios. Since the PRC's investment rate (relative to GDP) is at least one-third higher than India's, the FDI/GDI (investment) ratio for the two countries is about 2:1. Thus, in the PRC-India comparison, more generally, the PRC emerges as less of an outlier. Its magnitudes are extremely large as much owing to its size as its openness to foreign direct investment.

2. Changing Sectoral Composition of FDI Flows

Prior to the 1980s, most FDI in developing countries was in extractive industries and import-substituting (IS) manufacturing. The first major compositional shift was within manufacturing, from IS to export-oriented manufacturing. This transition commenced in the late 1960s, but really accelerated from the 1980s. A more recent shift has been toward services. By 2000, about half the total stock of FDI in developing countries was in services, more than double the figure in 1990 (UNCTAD 2002). Three factors principally account for this trend: the rising share of services in practically all countries, the increasingly tradable nature of many service outputs, and liberalized entry into many service industries previously closed to foreign businesses.

These global changes are evident in all six economies, as service industries have been opened up to foreign direct investment. The changes are particularly pronounced in the more recently reforming economies. In the PRC, FDI began entering the banking and foreign and domestic trade sectors in the 1990s. With its WTO accession, insurance, telecommunications, and other sectors are being progressively opened. Liberalization in India has resulted in a sharp decline in the earlier dominance of manufacturing in FDI flows, from 85 to 48 percent of the total. Most of the increase has gone into services. There is also a more even distribution of FDI across subsectors. In Korea, most service industries were closed to MNEs prior to the 1990s. Here too reform has led to a major reallocation of FDI flows.

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[6] For a recent summary of the debate, see *The Economist* (2003).

3. Changing Modalities of Capital Flows

For a time in the 1990s, portfolio investment flows in Southeast Asia exceeded FDI (see Table 2). During and after the 1997-1998 crisis, this trend was dramatically reversed. Moreover, the nature of FDI is also changing. The old pattern of greenfields FDI, and durable, long-term joint ventures is increasingly being replaced by M&As and volatile, opportunistic, and short-term relationships. The extent of M&A FDI is poorly documented, but appears to be increasing in most countries. These activities certainly increased in the late 1990s in the crisis-affected countries, as exchange rates and stock markets collapsed, inducing so-called "fire-sale FDI", to be discussed shortly. Korea's experience clearly illustrates this phenomenon: in the wake of the crisis, portfolio and other short–term capital outflows were very large, while inward FDI flows rose strongly over the period 1997-1999. In India, the major compositional shift was the type of FDI, and it has more to do with policy changes than economic crisis. During the restrictive era, virtually all FDI was "greenfield" by government dictate; now about 40 percent is mergers and acquisitions.

Foreign direct investment has been the major source of capital flowing into the PRC, dwarfing portfolio investment owing to the semiclosed capital account, including restrictions on foreigners trading shares on the domestic stock market. A similar picture holds for Viet Nam, which has the least internationally integrated capital market among the six. In contrast to the other countries, and reflecting its consistently open regime, Malaysia has traditionally received most of its capital in the form of FDI, which declined during the onset of the crisis, but remained large. In the wake of the September 1998 imposition of capital controls, portfolio flows turned negative, but FDI held up.

4. Varying Major Sources of FDI across Countries

Europe, Japan, and US are typically the major investors. In some cases, much smaller, but very open, proximate, and historically connected economies are major players in much larger economies. Thus, Hong Kong, China is the largest investor in the PRC, given its traditionally important (though declining) role in connecting that country to the global economy. The round-tripping phenomenon alluded to above is also a factor. Singapore remains a significant actor in Malaysia, reflecting their historically close commercial and political ties. A major foreign investor in India is Mauritius where, in addition to historical connections, special taxation privileges have played a key role.

The 1970s and 1980s FDI debates about whether particular source countries matter, and whether some are more desirable than others, no longer resonate in these six countries, or more generally.[7] This is so for several reasons: the demonstrated evidence that well-managed FDI contributes to growth, regardless of its origins; international competition for FDI is more intense; there is a greater diversity of sources as compared to earlier periods of American and European domination; and even quite low-income countries are also investing abroad. Much of the "FDI differences" literature simply reflected the particular stages of development of the home countries. These alleged "unique" MNE characteristics generally faded as the source countries were transformed.

5. Behavior during Crises, Magnitude, and Composition of FDI Flows

Three of the six economies in the sample (Korea, Malaysia, Thailand) were severely affected by the 1997-1998 Asian economic crisis, and in another (Viet Nam) growth slowed markedly. It is therefore useful to examine briefly the behavior of FDI, and related policy responses, during this episode. Sudden capital flight is a central feature of modern economic crises. Crisis economies typically switch quickly from current account deficits to surpluses. On the current account, expenditure switching and absorption effects reduce imports and promote exports. In addition, slower economic growth and increased economic and political uncertainty result in the rest of the world being unwilling to finance a current account deficit.

Moreover, the behavior of different forms of capital diverge. Portfolio and other forms of highly mobile capital are more likely to exit a country. By contrast, FDI flows are typically much less volatile. In fact, post-crisis FDI may well increase, along the lines postulated in Krugman's "fire-sale FDI" thesis (Lipsey 2001). Asset prices are now cheaper, owing to depreciated exchange rates, demand contractions, and financial collapse. Policy regimes are typically liberalized as part of the government's recovery package. Athukorala (2003) demonstrates that this is precisely what happened in most of the five East Asian crisis-affected countries during 1997-1998. In aggregate, there was massive capital flight, principally portfolio investment and short-term debt. Yet FDI actually rose modestly.

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[7] This debate included the assertions that Japanese and "Third World" FDI were superior to that from America and developed countries, respectively. Kojima (1996) was commonly associated with the former argument, while Wells (1983) was a major early study of the latter.

Foreign direct investment may also play an important role during the recovery of crisis-affected economies. The analytical connection between the two starts with the collapse in aggregate demand during a crisis: consumer confidence and therefore expenditure wanes; the capacity for governments to run fiscal deficits is often constrained; and domestic investment falls owing to financial fragility and weak domestic demand, and uncertainty. Exports are therefore the critical component in the immediate recovery period. Crucial to the latter are multinational enterprises. Given their global market networks and know-how, deeper pockets, and stronger connections to global capital markets, MNEs have the capacity to translate large increases in potential competitiveness (arising from the depreciated currency) into export growth, in turn facilitating economic recovery.[8]

E. Investment Outflows

Capital outflows are central to the process of globalization. Although occasionally the subject of mercantilist objections, to the effect that national savings are being employed for the benefit of foreigners, theory and empirical evidence point clearly in the opposite direction. Outward FDI benefits the home economy, since domestic factors of production are able to maximize their returns. It is also presumed to constitute a spur to better economic policy, to the extent that the option of "exit" for investors exerts a policy discipline on governments. Outflows present a mixed and imperfectly recorded picture, but it is clear that patterns vary across the six economies. In all but Viet Nam these investments abroad are sizeable. In all cases, there has been a general relaxation of controls on outflows, although in some cases quite onerous restrictions remain in place. However, with the occasional exception of Korea, all six are net FDI recipients.

Three general features of these outflows are worthy of mention. First, as noted elsewhere, many of the outward investment projects draw on the countries' overseas communities, to be expected given that this diaspora lowers the transaction costs of going abroad. Second, in countries with complex regulatory systems, outward FDI may be a means of exploiting firm-specific advantages in a less restrictive environment. This has been hypothesized in some of the Indian literature, though presumably it is now a less important motive. Third, it appears to be the case that increasing outward FDI has contributed to the liberalization of policies toward FDI inflows. The argument is that investing abroad does introduce an appreciation of the case for a more predictable and open regime. This has evidently been the case in Korea, particularly in the context of its OECD accession.

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[8] The 1997-1998 crisis also served as a reminder that restrictions on short-term capital flows may, in special circumstances, be compatible with an open FDI regime, at least in the short to medium term. This is the major conclusion of the controversial Malaysian policy experiment introduced in September 1998. See Athukorala (2001) for a detailed examination.

The Korean case, with its relatively low per capita income, becoming a large investor abroad with outflows often exceeding inflows is very unusual. This appears to reflect a number of factors. One is its traditionally restrictive approach to inflows. The second was the country's rapid loss of comparative advantage in labor-intensive activities during the 1980s and the consequent relocation on a massive scale of much of this industry to high-growth, receptive economies nearby. A third was the aggressive internationalization of the major chaebol from the late 1980s, with support from the government. A considerable proportion of the FDI was high-end investment in sectors where protection in the targeted markets necessitated investment rather than export from the home base (e.g., the automotive and consumer electronics industries). "Reverse engineering" type FDI, to obtain access to host country technology, has sometimes been a factor.

The PRC is also emerging as a major investor abroad. This phenomenon may appear surprising in view of its rapid growth, with the presumption that returns on capital would be higher at home than abroad. Three factors appear to be relevant in this story (Garnaut and Song 2003). One relates to macroeconomic policy. The PRC is running large current account surpluses and accumulating massive international reserves, currently estimated to exceed $400 billion. Most of these reserves are held abroad, albeit largely in the form of government securities rather than FDI. The second factor is the round-tripping phenomenon referred to above. This is not of course genuine FDI, and should be discounted from the outflows figure. The third are investments abroad by state-related entities in sectors deemed to be of commercial and strategic importance, such as natural resource projects.

For some countries, it is useful to distinguish between what may be termed "state-sponsored" and "market driven" investments. This is evident in Malaysia, for example. The government has sponsored several major investment projects abroad, including directly through its state-related entities. Some of these have been high-profile, quasipolitical investments in developing countries, with mixed commercial results. Alongside these have been straightforward efficiency-motivated investments, principally in neighboring countries and reflecting firms' competitive advantages.

F. Trade Regimes

Openness to the international economy varies significantly among the six. All have become more open to trade since 1990, as indicated by both trade reforms and rising trade/GDP ratios. The latter ratio has increased by more than 50 percent in three of the countries (PRC, India, and Thailand) and substantially in the others (Table 3).[9] Malaysia and Thailand were among a very small group of developing economies classified by Sachs and Warner (1995) as "always open." Both exhibit very high trade orientation, quite low average tariffs, modest interindustry tariff dispersion, and limited incidence of nontrade barriers.

Among the six, Korea's trade and investment regime has arguably been the most unusual. From the early 1960s, it achieved very rapid export-led growth, but in the context of (until recently) very restrictive policies toward imports (except those required by export-oriented firms) and foreign direct investment. Its adventurous industrial policy resulted in tremendous achievements but also high costs.[10] However, major reforms were enacted in the 1990s. In addition to tariff reform and the reduced incidence of nontrade barriers, these also included a reduction in the number of subsidy programs and customs simplification. As with its FDI regime, a desire to join both the GATT/WTO and the OECD, and the imperative to reform in the wake of the 1997-1998 crisis, drove much of the liberalization.

Notwithstanding recent reforms, PRC, India, and Viet Nam still have quite high tariffs, and a higher incidence of nontrade barriers. Smuggling remains rampant in the more protected economies. In particular, Viet Nam's reengagement with the international economy is of very recent origins. For much of the period following the commencement of its 1986 Doi Moi reforms, it was effectively shut out of the world's largest market. The US embargo was lifted in 1993, while the two countries signed a Bilateral Trade Agreement only in 2001. As is the case with late reformers, its official trade regime remains opaque and poorly documented. It is only quite recently that a formal tariff schedule was released. Viet Nam still retains very high levels of protection (several hundred percent) for its automotive, sugar, and garments industries. Much protection is firm-specific in nature, tailored to the needs of its inefficient SOE sector.

A central feature of trade reform in all six economies is that it was unilateral in nature. While four of the countries are members of preferential trading arrangements—ASEAN in the case of the three Southeast Asian economies and SAARC (South Asian Association for Regional Cooperation) for India—in practice these arrangements have meant practically no deviation from nondiscriminatory reform.[11] This may be changing, however. With the current US-led penchant for free trade arrangements (FTA), all six have been forced to follow suit, and explore FTA options. Among the six, Korea and Thailand in particular have been active. If these FTAs ever become significant, MNEs will certainly respond by including preferential access to selected export markets as a factor in their decision-making processes.

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[9] Of course, the usual caveats have to be attached to the data in Table 3. Trade/GDP ratios need to allow for country size. Average tariffs need to take account of tariff dispersion and the presence of nontrade barriers. To varying degrees, all six countries maintain dual trade regimes as between export sectors and the domestic economy. Nonetheless, the picture presented here is a reasonably plausible characterization of the country differences.

[10] For contending perspectives on the impact of these interventions, see for example Amsden (1989 and 2001) and Smith (2000).

[11] That is, the AFTA liberalizations have almost always been multilateralized, while the SAARC concessions have been trivial.

G. The Commercial Environment

The large variations in the foreign presence among the six economies are explained fundamentally by the attractiveness of the host economies to foreign direct investment. This in turn reflects the rate of economic growth in each, and the ease of entry for foreign investors. In addition to macroeconomic management and openness, a number of factors codetermine both economic growth and FDI attractiveness. Several proxies for these factors are presented in Table 3. Informed analytically by what may be termed the "three Is" (incentives, infrastructure, and institutions), these variables include proxies for human capital, quality of physical infrastructure, institutional quality and country risk, and financial development. As economies open up, governments have to make the transition from protectionist/regulatory regimes to a new emphasis on promotion and efficiency. Thus, there needs to be more effective industrial extension, R&D, and other support schemes; better physical infrastructure; legal reform; improved education; and administrative reform and simplifications. Broader still are issues of country risk and policy predictability. Hence, countries' performance according to a range of "competitiveness" variables listed in Table 3 (numbers 3-6) is central to both attracting FDI and to economic progress.

It also needs to be emphasized that domestic investors are invariably the key players in any economy and that domestic investor sentiment weighs heavily in MNEs' international location decisions. Therefore what matters is the host economy's commercial environment in general, and not especially as it relates to foreign investors. Indeed, FDI regimes that are significantly "pro-foreign" in their incentives or other provisions are unlikely to be fiscally or politically durable, and these incentives tend to be discounted by MNEs with long time horizons. It is important that any study of competitiveness and the business environment recognize this fact.[12]

The proxies and data in Table 3 are of course highly selective, and subject to numerous qualifications.[13] But they are illustrative, and generally accord with a priori notions. Moreover, they effectively draw attention to the diversity of the six countries.

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[12] Of course, there will always need to be some special provisions in any investment law tailored specifically for foreign investors, e.g., guarantees against expropriation, etc.

[13] Numerous data sources could have been selected. A useful series, with heavy emphasis on technological capacity and learning, is presented in UNIDO (2002). ADB (2003a, Part 3) provides a comprehensive review of various competitiveness estimates.

The PRC's human capital base is comparatively strong, with near universal literacy, and segments of technical excellence. It is also increasingly able to tap into a very large international diaspora. It has R&D strengths, some military related, or present owing to the past emphasis on heavy industry. It is rapidly opening up to foreign trade and investment. Its commercial institutions have been historically weak, and the country continues to score poorly in international comparisons of corruption and protection of property rights. But institutional quality is improving quickly, especially in regions most connected to the international economy. Physical infrastructure is being upgraded rapidly, although its quality is spatially very uneven.

The 1991 reforms and their aftermath have begun to transform India's commercial environment, but the unfinished agenda is large and complex.[14] Its human capital and R&D base has pockets of international excellence, most notably in information technology and in some defense-related heavy industry. Until recently, and in contrast to much of East Asia, its educational priorities resulted in centers of international quality alongside quite high levels of illiteracy. It also differed from East Asia until recently in that its inward-looking strategy meant that it was unable to exploit its human capital strengths in the global economy. Thus, in contrast to the PRC, its major intrusion into the international information technology industry has been via services rather than manufacturing. Its commercial environment is broadly predictable, and the legal system cumbersome but independent. Economic policy making is the most dispersed among the six countries. A large diaspora facilitates its connections to the international economy.

Korea's development strategy has been underpinned by exceptional strength in some areas. It reached OECD levels of educational achievement and R&D expenditure at comparatively low levels of per capita income.[15] Its Internet access and usage is one of the highest in the world. Its infrastructure and institutional quality are good though not outstanding. As with its trade and FDI regimes, the internationalization of its human capital strengths has proceeded more slowly (Dahlman and Andersson 2000). For example, its universities remain relatively unconnected to the international mainstream. Its postcrisis policy liberalizations have been significant, but as recovery proceeds there are some doubts about the durability of some reforms.

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[14] For a detailed review of these issues, see the contributors to Krueger (2002). Major issues in the reform agenda include fiscal imbalances, public sector enterprises, trade policy (especially in consumer goods industries), labor market rigidities, SMEs and reservation schemes, regulatory and licensing system, and center-state relations. Many of these of course intersect.

[15] For example, R&D expenditure rose from 0.3 percent of GDP in 1971 to 2.8 percent in the mid-1990s.

Malaysia emerges as a country with comparatively high institutional quality, excellent physical infrastructure, and large public investments in education, much of it designed to redress past ethnic imbalances. It has had the most consistent commercial policy environment of the six. Nevertheless, there are concerns that the independence of its legal system may have been weakened over the past two decades, and there has been a persistent loss of high-level non-bumiputra human capital. Its very open international labor market has delayed the process of upgrading its technological capabilities, and it faces in particular competitiveness challenges from below (especially the PRC) and from above (the Asian newly industrialized economies).

Thailand scores well on most indicators, with the principal exception of human capital. Until recently, while achieving almost universal primary enrolments, its education retention ratios were very low. In consequence, during the 1990s, as real wages began to rise quickly in the wake of rapid economic growth, it experienced difficulty managing the transition out of labor-intensive activities. It has become progressively more open in its trade and FDI policies, although the pace of reform has been slower than several of its neighbors. Historically, its legal and commercial institutions were not strong, though its informal commercial rules of the game were widely understood and observed. Physical infrastructure is generally good, apart from Bangkok's congestion.

Having successfully completed the first round of macroeconomic and commercial policy reforms, the principal challenges in Viet Nam relate to establishing the infrastructure that underpins a market-based economy: property rights, legal system, financial intermediation, and physical infrastructure all remain poorly developed. Illiteracy levels are low, but so too is the stock of internationally experienced entrepreneurs. Many small and household enterprises operate in an insecure commercial environment. Reform of SOEs lags. There are pronounced regional differences (especially, still, between the north and the south) in the quality of the physical and commercial infrastructure.

Considering the wide variety of resource endowments, policy regimes, and experiences with FDI among the six economies, it is not surprising they have developed different views toward international investment agreements.

III. CONCLUSIONS

The experience of these six, diverse Asian economies illustrate the major challenges associated with managing FDI in an era of rapid globalization. All six have deliberately become more open to FDI and trade, and this openness has contributed to the strong growth experienced by most of the six for most of the past two decades or more. Outward FDI flows have also risen in all cases, consistent with rising global integration. The simultaneous liberalization of both trade and FDI regimes has profound implications both for the nature of FDI and government policies needed to maximize the benefits of the foreign presence for host economies. As trade and regulatory barriers come down, FDI motives typically shift from what may be termed "rent-seeking" to "efficiency-seeking." That is, as the rents associated with a highly interventionist regime diminish, MNEs assess potential investment locations on the grounds of costs and efficiency, frequently in the context of a multiplant and multicountry framework. Host country policy priorities therefore need to adjust accordingly, from dispensing rents and patronage to providing high quality institutions and infrastructure, which of course also benefit domestic investors. The faster the reform process, obviously, the faster this policy reorientation needs to proceed.

So much for the common features. There have of course been differences in the approach to FDI among the six countries in relation to speed of liberalization, modalities of capital inflow, and particular benefits sought from foreign direct investment. For Viet Nam, it is reengagement with the global economy in the context of "first-round" economic reforms. In the PRC, too, there is the transition from planned to market economy and progress toward a unified policy regime. Both processes started earlier, and are proceeding faster, than in Viet Nam. In India, the challenge is to build on the earlier reforms, and to become more "East Asian" in its labor-intensive export trajectory. Among the three crisis-affected economies, the immediate challenge since 1998 has been financial reform and recovery. In addition, Korea has sought to internationalize its human capital and R&D strengths, while Malaysia and Thailand face the challenges of upgrading supply-side capabilities as they lose comparative advantage in labor-intensive activities.

Not surprisingly, these countries have differed in their approach to the formulation of international regulations governing foreign direct investment. As with most developing countries, the six have liberalized their investment regimes independent of negotiations over a possible multilateral framework for investment. This has two possible implications. It might suggest that a multilateral framework is redundant. Or such a framework may become more necessary as policies converge, and a more comprehensive international agreement becomes increasingly possible and necessary for facilitating the liberalization process and for governing investment measures. Which outcome emerges will depend on the bargaining positions adopted by different countries and the attitudes they hold toward the process. Even among this sample of developing Asian economies there are clearly widely diverging views on negotiating a multilateral framework for investment. They range from strongly in favor (Korea) to strongly opposed (India); from viewing it as a helpful spur to domestic liberalization (Thailand) to a constraint on development policy options (Malaysia); and from acceptance if implementation is gradual (the PRC) to concern over capability to address the difficulties and challenges of achieving compliance (Viet Nam).

REFERENCES

ADB (Asian Development Bank), 2003a. *Asian Development Outlook 2003.* Hong Kong, China: Oxford University Press for the Asian Development Bank.

———, 2003b. *Key Indicators 2003.* Asian Development Bank, Manila.

Aitken, B., G. H. Hanson, and A. E. Harrison, 1997. "Spillovers, Foreign Investment and Export Behaviour." *Journal of International Economics* 43:103-32.

Amsden, A., 1989. *Asia's Next Giant: South Korea and Late Industrialization.* New York: Oxford University Press.

———, 2001. *The Rise of the Rest: Challenges to the West from the Late-Industrializing Economies.* New York: Oxford University Press.

Athreye, S., and S. Kapur, 2001. "Private Foreign Investment in India: Pain or Panacea?" *World Economy* 24(3):399-424.

Athukorala, P.-C., 2001. *Crisis and Recovery in Malaysia: The Role of Capital Controls.* Cheltenham: Edward Elgar.

———, 2003. "FDI in Crisis and Recovery: Lessons from the 1997-1998 Asian Crisis." *Australian Economic History Review* 43(2):197-213.

Barro, R., and J.-W. Lee, 2000. International Data on Educational Attainment: Updates and Implications. Working Paper No. 42, Center for International Development, Cambridge, Massachusetts.

Bora, B., 2001. *Trade Related Investment Measures and the WTO: 1995-2001.* United Nations Conference on Trade and Development, United Nations, Geneva.

Bosworth, B. P., and S. M. Collins, 1999. "Capital Flows to Developing Economies: Implications for Saving and Investment." *Brookings Papers on Economic Activity* 1:143-69.

Brooks, D. H., and H. Hill, eds., 2004. *Managing FDI in a Globalizing Economy: Asian Experiences.* London: Palgrave Macmillan.

Buckley, P., 2003. "The Challenges of the New Economy for Multinational Firms: Lessons from Southeast Asia." In F. Bartels and N. Freeman, eds., *The Future of Foreign Investment in Southeast Asia.* London: Routledge-Curzon Press.

Dahlman, C. J., and T. Andersson, 2000. *Korea and the Knowledge-Based Economy: Making the Transition.* World Bank/OECD, Washington D.C. and Paris.

Freeman, N., 2003. "The Prospects for Foreign Direct Investment in the Transitional Economies of Southeast Asia." In F. Bartels and N. Freeman, eds., *The Future of Foreign Investment in Southeast Asia.* London: Routledge-Curzon Press.

French, H., 1998. "Capital Flows and Environment." *Foreign Policy in Focus* 3(22, August):1-4.

Ganesan, A. V., 1998. Strategic Options Available to Developing Countries with Regard to a Multilateral Agreement on Investment. UNCTAD Discussion Paper No. 134, United Nations Conference on Trade and Development, Geneva.

Garnaut, R., and L. Song, eds., 2003. *China: New Engine of World Growth.* Canberra: Asia Pacific Press.

Gomez, E. T., and K. S. Jomo, 1997. *Malaysia's Political Economy: Politics, Patronage and Profits.* Cambridge: Cambridge University Press.

Hallward-Dreimeier, M., 2003. Do Bilateral Investment Treaties Affect Foreign Direct Investment? Only a Bit...and They Could Bite. Working Paper No. 3121, The World Bank, Washington, D.C.

Hill, H., 2002. "Spatial Disparities in Developing East Asia: A Survey." *Asian-Pacific Economic Literature* 16(1):10-35.

International Monetary Fund, 2004a. *World Economic Outlook Database.* Available: http://www.imf.org/external/pubs/ft/weo/2004/01/data/index.htm.

———, 2004b. *International Financial Statistics Online.* Available: http://ifs.apdi.net/imf/ifsbrowser.aspx?branch=ROOT.

Japan Bank for International Cooperation Institute (JBICI), 2002. Foreign Direct Investment and Development: Where Do We Stand? JBICI Research Paper No. 15, Tokyo.

Joshi, V., 2003. "India and the Impossible Trinity." *World Economy* 26(4):555-83.

Joshi, V., and I. Little, 1997. *India's Economic Reforms 1991-2001.* Oxford: Oxford University Press.

Kojima. K., 1996. *Trade, Investment and Pacific Economic Integration.* Tokyo: Bunshindo.

Kumar, N., 2004. "India." In D. H. Brooks and H. Hill, eds., *Managing FDI in a Globalizing Economy: Asian Experiences.* London: Palgrave Macmillan.

Krueger, A. O., ed., 2002. *Economic Policy Reforms and the Indian Economy.* New Delhi: Oxford University Press.

Lardy, N. R., 1996. *The Role of Foreign Trade and Investment in China's Economic Transformation.* New York: Oxford University Press.

Lipsey, R., 2001. Foreign Direct Investment in Three Financial Crises. NBER Working Paper No. 8084, National Bureau of Economic Research, Massachusetts.

Miles, M. E., J. Feulner, and M.A. O'Grady, eds., 2004. *Index of Economic Freedom.* The Heritage Foundation and the Wall Street Journal. Available: http://www.heritage.org/research/features/index/.

Moran, T. H., 2002. *Strategy and Tactics for the Doha Round: Capturing the Benefits of Foreign Direct Investment.* Asian Development Bank, Manila.

O'Donovan, D., 2000. "Economy-Wide Effects of Direct Foreign Investment: The Case of Ireland." Paper presented at the Conference on Export Development in the Millennium: Challenges and Opportunities for Latin America and the Caribbean, InterAmerican Development Bank, 18 September.

Organisation for Economic Co-operation and Development, 1996. *Trade and Competition: Frictions after the Uruguay Round.* Paris.

Ramstetter, E., 1999. "Comparisons of Foreign Multinationals and Local Firms in Asian Manufacturing over Time." *Asian Economic Journal* 13(2):163-203.

Razin, A., E. Sadka, and T. Coury, 2002. Trade Openness and Investment Instability. NBER Working Paper No. 8827, National Bureau of Economic Research, Massachusetts.

Sachs, J., and A. Warner, 1995. "Economic Reform and the Process of Global Integration." *Brookings Papers on Economic Activity* 1(1):1-95.

Smith, H., 2000. *Industry Policy in Taiwan and Korea in the 1980s: Winning with the Market.* Cheltenham: Edward Elgar.

Tangkitvanich, S., D. Nikomborirak, and B. Krairiksh, 2004. "Thailand." In D. H. Brooks and H. Hill, eds., *Managing FDI in a Globalizing Economy: Asian Experiences.* London: Palgrave Macmillan.

Tham, S. Y., 2004. "Malaysia." In D. H. Brooks and H. Hill, eds., *Managing FDI in a Globalizing Economy: Asian Experiences.* London: Palgrave Macmillan.

The Economist, 2003. *Two Systems, One Grand Rivalry.* 21 June, 57-60.

Transparency International, 2003. "Corruption Perceptions Index." Available: http://www.transparency.org/.

United Nations Conference on Trade and Development (UNCTAD), 2002. *World Investment Report: Transnational Corporations and Export Competitiveness.* United Nations, Geneva.

———, 2003. *World Investment Report 2003—FDI Policies for Development: National and International Perspectives.* United Nations, Geneva.

———, 2004. Foreign Direct Investment Database. Available: http://www.unctad.org/Templates/Page.asp?intItemID=1923&lang=1.

UNIDO, 2002. *Industrial Development Report 2002/2003: Competing Through Innovation and Learning.* United Nations Industrial Development Organisation, Vienna.

United Nations Population Division, 2004. *World Population Prospects: The 2002 Revision.* Available: http://esa.un.org/unpp/.

Wells, L. T. Jr., 1983. *Third World Multinationals.* Cambridge: MIT Press.

Wells, L. T. Jr., and A. G. Wint, 1991. "The Public-Private Choice: The Case of Marketing a Country to Investors." *World Development* 19(7):749-61.

World Bank, 2003. *World Development Indicators Database.* Available: http://www.worldbank.org/data/wdi2004/index.htm

World Economic Forum, 2003. *Global Competitiveness Report.* Available: http://www.weforum.org/.

Liberalization and Foreign Direct Investment in Asian Transport Systems: The Case of Aviation

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The aviation industry is critical for Asia to gain from participation in the global economy. The airline industry in developing Asia is generally dominated by state-owned enterprises, and the record of state ownership is poor. Foreign direct investment would provide the managerial and technical skills needed to improve productivity. Paradoxically, however, this is an industry that combines extensive cross-border activities with almost insurmountable obstacles to foreign investment. Airline alliances and marketing arrangements have emerged as an imperfect substitute to consolidation through (cross-border) mergers and acquisition. This paper sketches the main features of international air transport, focusing in particular on the bilateral and multilateral regimes; presents the main characteristics of the developing Asia market and the specific Association of Southeast Asian Nations and Asia-Pacific Economic Cooperation forum objectives in this domain; analyzes ongoing developments in selected countries, in particular in privatizing flag carriers in India and Thailand and consolidating airlines in People's Republic of China; and concludes by putting findings from the region in the wider context of experiences in other developing regions and regulatory development at the multilateral level, including at the World Trade Organization.

I. INTRODUCTION

It may be counterintuitive to consider aviation a key policy issue for developing countries, especially for low-income ones. As Li (1998, 140) notes, "the traditional wisdom that air transport is a luxury transport mode is still common in much of Asia." This industry, however, is critical for the developing economies in the region to gain from participation in the global economy. It

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reduces the costs of trade, especially in high-value added supply chains such as electronics, perishable food, or cut flowers; attracts privatization-related investment; supports tourism; and more generally weaves together a modern society. The distances involved are large and alternative transport modes such as rail, road, and ports are inadequate and costly. Moreover, the existence of clear network economies makes the case for closer regional cooperation in general. In short, while the growth of civil aviation is partly contingent on the level of income, it lowers communication costs and facilitates access to global markets and foreign investment inflows. These effects are especially important for a number of low-density and land-locked developing countries.

These contributions are already evident in many economies in the region that have substantial aviation sectors. Although growth rates decelerated since the boom days of the 1990s, the Asian and Pacific region remains one of the world's most dynamic air transport markets (ICAO 2003). In 2001-2002, traffic growth in terms of both passenger-kilometers and total (freight and mail) ton-kilometers was the second highest in the world after the Middle East. As Table 1 reports, the People's Republic of China (PRC) is already the fourth largest freight market and the fifth largest passenger market; Hong Kong, China and Singapore are in the Top Ten list for international activities; and, perhaps the most surprising statistic, the ASEAN-5's (Association of Southeast Asian Nations members namely: Indonesia, Malaysia, Philippines, Singapore, and Thailand) combined countries would rank at second place after the United States (US) in terms of both passenger and cargo traffic. Table 2 provides some information about the top airlines in the region.

With few exceptions, the airline industry in developing Asia is dominated by state-owned enterprises. Although one such carrier, Singapore Airlines, has consistently been ranked as one of the world's best and most efficient, the record of state ownership in other airlines is poor.[1] Foreign investment in the sector is minimal, which is not an Asian exception (Backx et al. 2002). While foreign direct investment (FDI) would probably provide the managerial and technical skills needed to improve factor utilization, particularly in developing economies, extensive cross-border activities in this industry are combined with almost insurmountable obstacles to foreign direct investment. As Findlay et al. (1997, 21) noted,

> Bilateral aviation agreements often require substantial ownership and control of a partner country's qualifying airlines by citizens of the partner country. Such rules of origin play a role similar to that of rules of origin in preferential trading arrangements, in that they

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[1] In the three months to June 2003, Singapore Airlines recorded its first ever quarterly loss, attributed mainly to the effects of severe acute respiratory syndrome (SARS).

prevent third countries from obtaining the negotiated privileges through the back door. But they also hamper the free market by restricting the ability of airlines to consolidate with foreign carriers through equity transfers. To circumvent such barriers, airlines have had to enter into more indirect forms of cooperation, such as code sharing and joint marketing arrangement.

Table 1. **Basic Air Transport Statistics in Developing Asia**

	Total Operations				**International Operations**			
Country	**Rank**	**2002**	**2001**	**% Change**	**Rank**	**2002**	**2001**	**% Change**
				Ton/kilometers Performed (millions)				
PRC	5	16 200	13 846	17	13	5 400	4 538	19
Singapore	7	14 140	12 625	12	5	14 140	12 625	12
Hong Kong, China	n/a	10 821	9 662	12	n/a	10 821	9 662	12
Thailand	13	6 241	5 726	9	11	5 913	5 327	11
Malaysia	17	5 342	5 237	2	14	4 920	4 824	2
India	23	3 077	2 849	8	27	1 839	1 687	9
Indonesia	30	1 879	1 978	-5	35	1 093	1 271	-14
Philippines	33	1 728	1 662	4	32	1 520	1 462	4
Pakistan	35	1 322	1 437	-8	34	1 141	1 240	-8
Sri Lanka	44	778	819	-5	41	778	819	-5
Vietnam	45	756	646	17	49	562	480	17
Bangladesh	46	692	597	16	43	684	595	15
Brunei Darussalam	52	496	451	10	51	496	451	10
Macao SAR	n/a	232	213	9	n/a	232	213	9
Memorandum item								
ASEAN-5	2	27 630	27 227	1	2	27 586	25 508	8
				Passenger/kilometers Performed (millions)				
PRC	4	123908	105904	17	15	28 821	23 624	22
Singapore	8	75 620	70 019	8	6	75 620	70 019	8
Hong Kong, China	n/a	53 148	48 316	10	n/a	53 148	48 316	10
Thailand	15	48 337	43 943	10	12	45 084	40 616	11
Malaysia	17	36 897	35 822	3	14	32 191	30 953	4
India	20	27 929	25 623	9	24	15 504	13 843	12
Indonesia	27	18 149	15 920	14	32	10 298	9 808	5
Philippines	29	13 962	13 425	4	29	12 001	11 430	5
Pakistan	34	10 680	11 609	-8	33	9 089	9 879	-8
Sri Lanka	43	6 327	6 660	-5	39	6 327	6 660	-5
Vietnam	42	6 676	5 610	19	45	4 895	4 079	20
Bangladesh	48	4 661	4 397	6	46	4 583	4 324	6
Brunei Darussalam	54	3 715	3 607	3	51	3 715	3 607	3
Macao SAR	n/a	2 056	1 904	8	n/a	2 056	1 904	8
ASEAN-5	2	192965	179229	8	2	175194	162825	8

Notes: Most 2002 data are estimates, thus the ranking and the rate of growth may change when the final data become available. Source: ICAO (2003).

Table 2. **Largest Airlines in Developing Asia**

	Revenues (US$ m)	**Net Result (US$ m)**	**Passengers ('000)**	**RPK (millions)**	**FTK (millions)**	**State Ownership Stake**	**Alliance**
Singapore Airlines	5 930	601	15 002	71 118	6 075	100	Star
Cathay Pacific	4 242	51	12 321	49 041	4 854	25	Oneworld
Thai Airways	2 977	235	18 729	48 513	1 824	93	Star
Malaysian	2 331	89	16 208	26 897	1 924	100	No
China Southern	2 177	69	21 493	28 940	1 006	63	No
China Airlines	2 114	90	8 136	26 806	4 600	71	No
EVA	1 867	76	4 186	17 777	3 278	0	No
China Eastern	1 580	10	11 533	18 206	1 023	62	No
Garuda	1 059	69	7 453	16 715	345	100	No
Pakistan IA	726	31	4 166	10 779	209	58	No
Air China	n.a.	n.a.	10 587	24 001	1 876	100	No
Indian Airlines	n.a.	n.a.	5 542	7 554	111	100	No
Vietnam AL	n.a.	n.a.	3 745	6 123	139		No
Air India	n.a.	n.a.	3 344	12 584	354	100	No
Philippine Airlines	n.a.	n.a.	2 441	11 219	209	4	No
SriLankan	n.a.	n.a.	1 741	6 327	203	51	No

Notes: RPK (revenue passenger kilometers) is a measure of airline passenger volume. It is calculated by multiplying the number of revenue passengers carried on each flight stage by the flight stage distance.
FTK (freight tons kilometers) is a measure of airline freight volume. It is calculated by multiplying freight carried on each flight stage by the flight stage distance.

Sources: *AAPA Statistical Report 2002* (Association of Asia-Pacific Airlines 2002); *World Airline Report 2003* (Air Transport World 2003).

This paper seeks to define the potential contribution of FDI to the growth of the aviation sectors in developing economies in the region, and in that process to economic development. The paper will also identify the policy barriers inhibiting that contribution from FDI and the ways in which those barriers might be removed.

The paper begins with a review of the main characteristics of the regulation of international air transport, focusing in particular on the bilateral and multilateral regimes. Section III then discusses policy trends in the region, and notes an important new shock in the market place, which is the emergence of low-fare carriers. Section IV shifts attention to developments in selected countries to examine changes in policy that either add to or diminish the contribution that might be made by foreign investors. In Section V, the move to privatize carriers in India and Thailand and to consolidate (state-owned) airlines in the PRC is examined. In all such cases FDI has been an option, but very little progress has been achieved. In the conclusions the findings from the region are put in the wider context of experiences in other developing regions and regulatory development at the multilateral level, including at the World Trade Organization (WTO).

II. MARKET LIBERALIZATION AND FDI IN THE GLOBAL TRANSPORT INDUSTRY

Civil aviation for the transport of passengers and merchandise has always constituted a *sui generis* market, with the possible exception of its pioneering days when entry was basically unrestricted. The core characteristics that distinguish civil aviation from other industries now include:

(i) dominant state ownership, at least outside the US, and a higher degree of immunity from competition policy, partly on the grounds of national security and pride;
(ii) pervasive controls on entry, capacity, and tariffs, on the grounds of the size of investment needed and the presence of network externalities;
(iii) existence of an international regime with specific international organizations and institutions;
(iv) high degree of vertical integration, with *de jure* or *de facto* control and ownership links between physical infrastructure and air and ground services.

In this section, some of the key features of the regulatory system and their implications for foreign ownership, and its interaction with the WTO processes, are identified.

A. Key Features of the Regulatory System

The process and form of agreements governing air service is fairly uniform. Under bilateral air service arrangements (BASAs), airlines from each country are nominated to operate on a given route on the basis of agreements on capacity and frequency. The agreements cover the terms of the designation of the carriers, the methods to set capacity on a route, and any regulation that applies to fares. The restrictions include limits on access to routes by airlines based in third countries. Generally, foreign carriers are not permitted to operate on domestic routes.[2] Competition is further restricted by commercial arrangements between airlines dealing with royalties, traffic compensation, traffic, and revenue pooling. Therefore, if one airline wants to put more seats into the market, both countries must agree. Generally this type of control seems easy to enforce. In practice, control over passenger fare and cargo tariff regulations is illusory because of the complexity of airline yield management programs, now an accepted practice to enhance revenues.

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[2] Further detail is provided by Doove et al. (2001) and Findlay and Nikomborirak (2003).

Over the last two decades, OECD countries have made substantial progress in liberalizing ownership and market access. Key milestones have been the pioneering US domestic deregulation of 1978, the Australia-New Zealand Single Aviation Market Arrangements established in 1996, and the European Single Aviation Market completed in 1997. Additionally, since 1992, over 85 "open skies" BASAs providing full market access without restrictions on designations, route rights, capacity, frequencies, code sharing, or tariffs have been concluded by approximately 70 countries—in 59 of these cases involving the United States.

Bilateral air service arrangements dominate the exchange of market access rights in Asia. However, there have been significant recent developments toward a more liberal set of arrangements in the region including the adoption of "open skies" policies by a number of economies. In these policies, capacity restrictions are removed and a more liberal position may be taken toward foreign ownership. The US version of open skies agreements generally retains restrictions on foreign ownership and on rights to operate domestic services (cabotage). A plurilateral open skies agreement was signed among a group of regional (APEC-member) economies in November 2000 (Findlay 2003);[3] in 2000 a Memorandum of Understanding on Air Freight Services was signed by 10 ASEAN member states, which allows the designated airlines of each member state to operate all-cargo services of up to 100 tons weekly with no limitations on frequency or aircraft type, as a first step in the full liberalization of air freight services; in May 2003 Cambodia, Lao People's Democratic Republic, Myanmar, and Viet Nam (CLMV) adopted a Multilateral Agreement on Air Transport in the CLMV Sub-Region, which formalized a 1998 arrangement.

B. Restrictions on Foreign Ownership

A key feature of these arrangements is the ownership restrictions on airlines operating international services. Typically the right to take up the market access available in the BASA depends on the designated airline being "substantially owned and controlled" by the nationals of the economy involved. Further restrictions on the extent of foreign ownership apply at the national level, for example, caps on the extent of foreign ownership.[4]

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[3] The Asia Pacific Economic Co-operation forum (APEC) has endorsed the policy of developing "competitive air services" within the region by eliminating restrictions on air freight services and auxiliary airline commercial activities and allowing for multiple airline designation and the expansion of cooperative arrangements.

Table 2 includes data on the extent of government ownership among airlines in the region. In very few carriers the level of private ownership exceeds 50 percent. The exceptions are Cathay Pacific, Eva Airways, and Philippine Airlines. The extent to which governments can sustain the operations of loss-making carriers is an important policy issue in these markets. As in other industries, what FDI exists has been due to privatization—in particular in Sri Lanka (see Box 1).

Box 1. **Foreign Investment in Air Lanka**

The most important example of FDI in Asian air transport is the 44 percent participation (30 percent upfront and 14 percent staggered over two years) in Air Lanka that Dubai-based Emirates Airline bought from the government in April 1998 for US$70 million. Under the deal, Emirates was given management control of the company for 10 years, together with fuel concessions; an extension of a complete tax holiday up to March 2013; and the right to retain national carrier status. A new chief executive officer and the head of information technology were seconded from Emirates. Major programs have been the development of Bandaranaike International Airport in Colombo as a major passenger and cargo hub, the introduction of new management techniques and information technology equipment, and a rebranding program that included the adoption of a new name—SriLankan—in July 1999. The fleet was also modernized and is now wholly composed of Airbus aircraft.

While the company generated a profit from ancillary services such as cargo and catering, it was only in 2001-2002 that the airline business had a positive net income of US$16.6 million. Part of the reason was a slow but steady upward creep in passenger numbers—both ethnic Sri Lankans and overseas tourists. The turnaround was all the more surprising, since it came just over a year after a devastating raid by rebel Tamil Tigers on Bandaranaike airport, in which the airline suffered damage costing US$350 million. Domestic flights were also banned in 1996-2002 amid fears that the rebels would hijack a plane to carry out an attack. The airline also slashed costs, axing 1,500 jobs within weeks of the attack. At the same time, it moved to coordinate its remaining flights with those of Emirates.

Sources: SJ Associates (2001), BBC (2002), and Airlines International (2003).

Restrictions on cooperation through ownership links have prompted the development of global alliances, through which airlines aim to achieve economies of density (lowering costs by consolidating passengers on larger aircraft) and to provide a more extensive range of services and destinations. They also seek to provide feeder services for longer distance travel. Insofar as they are short-lived and unstable, however, airline alliances appear an imperfect substitute to consolidation through (cross-border) mergers and acquisition (Gudmundsson and Rhoades 2001). Unsure about the long-term survival of different arrangements, individual companies may be unwilling to accept the complexity and resource commitments that are necessary to minimize the risk of early termination of an alliance.

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[4] Chang and Williams (2001) provide further discussion of issues involved in changing these clauses.

Examples of alliances include Oneworld (of which American Airlines and British Airways are the leading members, accounting for 16.8 percent of world traffic in July 2003); Star (embracing United Airlines, Lufthansa, and their partners, accounting for 23.8 percent of world traffic); and Skyteam (led by Air France and Delta, accounting for 21.2 percent).[5] Although each of them counts at least an Asian partner—Korean Airlines in the case of Skyteam; Singapore and Thai in the case of Star—it is clear from Table 2 that most airlines in developing Asia are still "spinsters." Asian airlines have also sought to extend the service they offer through code-sharing and franchising, deepened in some cases by cross shareholdings. In these, typically a smaller airline operates thinner (often regional) routes using the brand and marketing services of a larger airline that would not be able to profitably operate such routes itself. These sorts of alliances and franchising agreements may raise competition and consumer concerns.

Due to the constraints of international treaties, there have been very few examples of airlines effectively merging their operations. European airlines face fewer ownership restrictions on continental routes, although constraints remain on merging business on international routes. Difficulties in cross-border mergers, however, are well known in the international business literature and in one case—Swissair's acquisition of Sabena in 1994-2000—both carriers were left bankrupt. A more recent example is the proposal in October 2003 to merge Air France and KLM. The two carriers will be owned by a joint holding company but will continue to operate as separate brands. The KLM operating company will be owned 51 percent by Dutch interests and so would protect the traffic rights that it now holds under Holland's bilateral air service arrangements. These conditions mean that the scope for cutting costs is limited. The airlines may instead be betting on a successful outcome of the US-European Union negotiations on a transatlantic market that would introduce a more liberal set of ownership rules.[6] Other such announcements might also be expected for this reason.

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[5] Market share data in this sentence were reported in *The Economist* (2003b). Non-alliance members account for 38.2 percent of world traffic.

[6] Material in this paragraph is based on *The Economist* (2003a).

C. Air Transport in the World Trade Organization

Current air transport commitments under the General Agreements on Trade in Services (GATS) only apply to three ancillary services: aircraft repair and maintenance, selling and marketing, and computer reservation. An annex to the agreement excluded consideration under the GATS of traffic rights and services related to traffic rights.

Like the Agreement on Agriculture, the GATS contains a "built-in agenda" mandating WTO members to reopen market access negotiations on services on 1 January 2000. In 2001, the WTO resumed its mandated review of the Annex on Air Transport Services and adopted the guidelines, procedures, and work program for the negotiations on services, including a number of air transport and tourism proposals (ICAO 2002). Proposals for additions to the Annex on Air Transport Services submitted to the Council on Trade in Services (CTS) included multilateralization of ground-handling services, airport management services, leasing or rental services of aircraft without operator, and services auxiliary to all modes of transport when delivered in an air transport context. There may be strong interests among airlines to have ground services included in the Annex to try to create more competitive markets for their provision. Also private investors in airports, now more common, may prefer to widen the coverage of the Annex to include airport services. However, the current review remains stalled and may close soon. Another review would then begin in 2005. At the same time, there are general negotiations in progress[7] and those economies with a strong interest might seek to return some specific air transport issues through those negotiations, for example, coverage of airport services and ground handling.

An important constraint on progress in the air transport negotiations has been the presence of another international organization with jurisdiction in the field. The International Civil Aviation Organisation (ICAO) has requested the WTO to develop a Memorandum of Understanding (MoU) to strengthen cooperation and help define their respective roles. In view of the lack of consensus on the development of the MoU, the subject was retained as a standing item on the agenda for a subsequent meeting. There has also been discussion in the WTO of a draft GATS Annex on Tourism. A proposal was discussed at the Council on Trade in Services that envisages access to air transport infrastructure and related services on a nondiscriminatory basis in addition to concerns for potential regulatory overlap on certain aspects of air transport (for more details of the proposed annex, see World Trade Organization 2001).

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[7] At the fourth WTO Ministerial Conference held in Doha, objectives and timetables for the negotiations initiated in January 2000 were elaborated with a view to promoting the economic growth of all trading partners and the development of developing and least developed countries. It was also decided that WTO Members shall submit initial requests for specific commitments by 30 June 2002 and initial offers by 31 March 2003. However only 42 members had submitted offers by April 2004 (ICTSD 2004a). In the General Council decision of July 2004, a new deadline has been set for May 2005 (ICTSD 2004b).

D. Impact of Regulation

Research on the impact of regulation indicates that reform in this sector would be expected to lead to significant price reductions, which could also be taken as quality improvements to make the sorts of contributions to development we noted earlier. Doove et al. (2001) extended earlier OECD work (Gonenc and Nicoletti 2001) to calculate an index of restrictiveness associated with air transport policy in for each country. Policy aspects in the index included:

(i) designation requirements (single, multiple, or no restriction)
(ii) capacity regulation (predetermined, free determination, other formulas)
(iii) price regulation (various formulas, no requirement)
(iv) treatment of nonscheduled services

In the index calculation, each component accounted for between 22 and 27 percent of the score.[8] Components were scored between zero and one, with lower scores corresponding to more liberal regimes. The weighted index value therefore also ranged between 0 and 1.

Figure 1 shows the index values for the Asian and Pacific economies. The figure illustrates, firstly, the wide variation in policy regimes in the region. The figure also illustrates the relatively restricted nature of the regimes. In comparison, apart from Switzerland, the index values for the European countries are all less than 0.4 (e.g., the United Kingdom index value is 0.30, for Ireland 0.21, and Portugal lowest at 0.14). Of the economies in Figure 1, only New Zealand and the US show a score of less than 0.4. Restrictions of the type captured in the index are estimated to have a significant impact on airfares. Discount level fares in the Asian and Pacific region are estimated to be 12 percent and 22 percent higher in the region because of the presence of the restrictions (Doove et al. 2001, Table 2.3).

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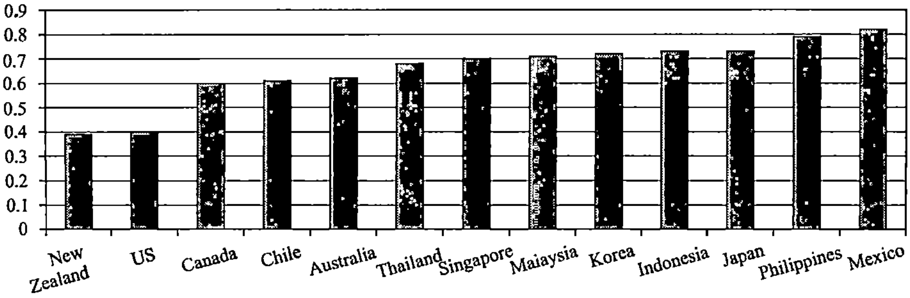
[8] These weights are derived from a factor analysis of the variation in the components of the index. See Gonenc and Nicoletti (2001). The scores of the degrees of restrictiveness are based on qualitative assessments by researchers.

Figure 1
Restriction Indices for air Transport, Selected APEC Economies



Liberalization will create opportunities for developing economies to enter this business. There are wide ranges between countries of costs of operation in air transport (Oum and Yu 1998) and developing economies can be internationally competitive in some or all parts of the business. Their areas of specialization are likely to evolve as they develop and as real wage rises. They may enter the industry providing back-office functions and gradually make the transition to more skill-intensive parts of the business, such as flying operations or engineering services. Their capacity to enter the market for air transport services, or the markets for inputs to air transport, will be accelerated by the capital and complementary inputs that foreign ownership provides. However, an interesting question in this context is whether the foreign capital is best provided by another airline or whether a portfolio investor could also provide valuable foreign investment. The case studies contain relevant material.[9]

E. Paths to Liberalization

There are different paths to reform in such a complex regulatory environment. One option is to focus on the liberalization of capacity controls, which is equivalent to removing restrictions on designated airlines on supplying services from their home base. Another is to concentrate on removing the restrictions on ownership, which is equivalent to liberalizing the conditions for designation, and permitting higher levels of foreign ownership.

Oum (1998) made a case for liberalization of capacity among Asian carriers by establishing their own open skies arrangements. United States carriers, Oum argued, benefited from the series of open skies agreements which the US had signed with a number of Asian economies and which gave US carriers more flexibility in some cases to establish regional networks compared to their Asian competitors. This happens because the US carriers were able to combine their rights in the US open skies to fly beyond points in the Asian partner economies, whereas the agreements applying to services provided by carriers based on those economies on route between them might be restrictive. His suggestion was to dismantle the bilaterals that were restricting the building of an efficient intra-Asian network. As well as establishing a timetable for regional open skies, preliminary steps could include relaxing the ownership limits on second-level carriers; moving faster on charter, freight, and secondary airport services; and further multiple designation of carriers.

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[9] Australian carrier Qantas has argued that the limits on foreign ownership (49 percent cap) increase its cost of capital.

Loosening the rules of ownership, in a setting without capacity controls, relaxes a regulatory barrier to entry.[10] Trading partners, however, must agree to accept the relaxation of the rule of origin. A change of this type is more likely to be adopted, therefore, in a cooperative approach to reform. A larger group of economies, for example, could accept designation of any airline based in any member economy, or of one owned and controlled by interests from any of the economies in the group. The outcome of the negotiations between Europe and the US on new arrangements across the Atlantic will provide a model of how this approach could be made to work outside the original group of economies that recognize each other's airlines.

An example of a mixed approach to liberalization is intra-Arab air services, where the Arab Civil Aviation Commission (ACAC) is gradually ending restrictions on market access for carriers of its Member States. The process provides for designation of more than one carrier with rights to operate on the routes to which the agreement applies. It also provides for carriers with modified national ownership and control criteria, and encourages code sharing as well as co-operation, particularly in ground handling. In Latin America, Ministers of Transport endorsed a common regional air transport services liberalization policy in November 2000 and the process of liberalization is in progress. In the Southern African Development Community, Chapter 9 of the Protocol on Transport, Communications and Meteorology deals with civil aviation (Goldstein 2003).

Even more substantial changes are proposed in the report of the ICAO meeting ("Consolidated Conclusions, Model Clauses, Recommendations and Declaration of Principles"), which reflects the positions put forward by the airlines themselves (as presented by the International Air Tranport Association [IATA]) on liberalizing national ownership and control rules and separating commercial ownership from regulatory control.[11] The model clause on designation proposed by ICAO includes the following:

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[10] Permitting more carriers to enter a market in which a capacity constraint applies could lead to a reallocation of capacity. The outcome would depend on the rules used for the allocation of the capacity available.

> *"Article X: Designation and Authorization*
>
> 1. Each Party shall have the right to designate in writing to the other Party [an airline] [one or more airlines] [as many airlines as it wishes] to operate the agreed services [in accordance with this Agreement] and to withdraw or alter such designation.
> 2. On receipt of such a designation, and of application from the designated airline, in the form and manner prescribed for operating authorization [and technical permission,] each Party shall grant the appropriate operating authorization with minimum procedural delay, provided that:
>
> (i) the designated airline has its principal place of business [and permanent residence] in the territory of the designating Party;
> (ii) the Party designating the airline has and maintains effective regulatory control of the airline;
> (iii) the Party designating the airline is in compliance with the provisions set forth in the Articles on Safety and Aviation Security; and
> (iv) the designated airline is qualified to meet other conditions prescribed under the laws and regulations normally applied to the operation of international air transport services by the Party receiving the designation.

The criteria for establishing "principal place of business" include establishment, incorporation, extent of operations and physical facilities, payment of income tax, registration of aircraft, employment of nationals in management, and operations. These provisions are similar to those that apply to establishment of "origin" as applied in a preferential trade agreement incorporating services. The provisions are therefore not equivalent to those that might apply in free trade, where it would be expected that regulation would only refer to recognition of provisions on technical issues.

In the ICAO model clause, it is suggested that the technical regulation would include valid operating licenses, and meeting global safety and security standards. There is also reference to "financial health" and "assurance of service", which can be interpreted as consumer protection issues, and are relevant in these forms for cross border supply of services.

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[11] The conference also endorsed the multilateral interline system and the existing slot allocation process.

F. Emergence of Low-fare Carriers

Asian air transport markets have seen the emergence of new low-fare airlines, which have become an important source of pressure for change and adjustment among the established operators. In OECD countries, the low-fare carriers offer more and more people access to air transport. In Asia, their potential contribution will be reinforced if it were possible to promote foreign participation in ownership and management and by loosening the ties on the design of their networks. Without commitments to adjust their own pricing and service packages and to cut their costs many traditional full service operators will face a rapidly deteriorating financial situation.

There is a range of models of emerging[12] low-fare carriers that tend to have in common a "star" network involving one aircraft type with high utilization rates (also requiring short turnaround times), low fares, and uniform and few service standards in the cabin. In some dimensions, such as on-time departures and baggage handling times, their quality of service can be relatively high. Their route networks might set them in closer competition with rail operators or road transport. Given the quality of cabin service, they are likely to be more competitive on shorter routes. They tend to make greater use of on-line ticketing. A low-cost carrier establishing on the basis of a "greenfield" business could also have lower labor costs compared to incumbent operators. Low-fare carriers tend to prefer to operate from regional or secondary airports. The traditional full service carrier in contrast tends to have more complex networks, involving hub and spoke structures, with a variety of cabin service standards and a range of aircraft types. They also offer other services such as frequent flyer plans and airport lounges (at no charge).

In the Asian and Pacific region, there are low-fare carriers in (among other cases) India, Japan, [13] Malaysia, New Zealand, Philippines, and Thailand. Australia's Virgin Blue and AirAsia, based in Malaysia, are among the success stories—the latter was the world's first airline to let customers book reservations with a mobile phone text message. Some low-fare carriers have high market shares. Further details of the carriers operating in India and Thailand are presented in the case studies below.

Virgin Blue illustrates the advantage of foreign investment in this sector. It was established in September 2000 by the Virgin Group as a fully foreign-owned carrier operating the domestic Australian market. The owners brought with them the marketing techniques and operating methods of the low-cost carrier, which rapidly moved to 30 percent of the domestic market. Half the business was later sold to domestic investors and in December 2003 the owners floated 29 percent of the company on the stock market (the Virgin Group then held just over 25 percent). An international business (Virgin Pacific) has also been established, which is eligible for Australian traffic rights because of its level of domestic ownership.

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[12] Rose (2004) reviews the evolution of the business model of a low-fare carrier.

[13] Established Japanese domestic airlines reacted to the entry of Skymark Airlines by adopting pricing policies that the Fair Trade Commission subsequently considered predatory. In response to the merger between Japan Airlines and Japan Air System, the Fair Trade Commission also required both airlines to give up 12 slots at Tokyo's crowded Haneda airport, the use of which has been requested by Skymark.

Low-fare carriers are able to challenge incumbents when governments deregulate entry by locally owned firms. But a disadvantage of these carriers in Asia (other than perhaps the PRC) is the smaller geographic areas of economies compared to the US or Europe, which can limit the number of points served in their star-shaped networks (to duplicate the hub and spoke system of the full service carriers would undermine an important source of their competitiveness). As they grow, low-fare carriers will confront the regulatory constraints applying in international markets.

An executive of Virgin Blue has stressed the importance of efficiency in their success (Huttner 2003, 32):

> Big carriers have this view: They think if you start taking away the meals and beating up your staff on wages, that's all it takes to be a budget carrier. It's much more than that—even with that, they still can't meet our efficiencies.

Ergas and Findlay (2003) review some of the impact of the entry of Virgin Blue into the Australian market. They conclude that entry leads to significantly lower prices but also a wide wedge between full economy and discount fares. The discounting induces substantial growth in traffic. The full service carriers do have advantages in terms of their network structures and their ability to generate feeder traffic for other parts of their networks. They also offer a range of differentiated services and can use their extensive yield management systems to set the appropriate prices for those services. The full service carrier, many observers expect, can survive on the basis of these features, subject to further efficiency gains, but at the same time the competitive threats from the low-fare carriers are not abating.

III. SELECTED CASE STUDIES

The preceding review of the policy environment in international aviation shows the extent to which foreign participation in those markets is currently impeded by a variety of barriers. However we have also noted how forces in the market place, especially originating among the low-cost carriers, are putting pressures on the traditional full-service carriers to adjust through new strategies, including privatization. A higher level of foreign participation is clearly a key component of that adjustment. The purpose of the case studies below is to examine how these contradictory forces might be resolved and whether there are ways around the policy impediments now in place. Included in the case studies are the PRC and India, large markets where travel demand is growing rapidly; and Thailand, the second largest ASEAN market after Singapore where some of the above-mentioned market pressures are already evident.

A. People's Republic of China

Although the PRC's airline industry can trace its origin to 1920—and foreign capital did play a major role at the time (Allen and Donnithorne 1954, 142-3)—in the four decades after 1949 it functioned as a paramilitary organization within the Civil Aviation Administration of China (CAAC). Regulatory, managerial, and operational responsibilities for both airlines and airports were all tightly performed by the CAAC. Since the country embarked in economic reforms in 1979, business aspects were brought to bear on the industry, the regulator was separated from the operator, the CAAC monopoly was broken by establishing six separate national airlines, and both market entry and route entry were eased (Zhang 1998). Civil aviation has grown rapidly, not only compared to other world markets, but also way ahead of other domestic transport modes—its proportion of total passenger modes increasing from 1.7 percent in 1980 to 7.6 percent in the first six months of 2003 despite the SARS crisis.[14] Total factor productivity also grew rather significantly, although the advance was mainly due to the addition of new capital (i.e., aircraft) and labor productivity slowed down markedly after 1996 (Zhang and Chen 2003).

Less restrictive BASAs, especially with the US, the slow emergence of an integrated air transport policy for the Greater PRC region, WTO membership, and the Beijing Olympics in 2008 are all likely to contribute to further market growth. According to Boeing's 2002 *China Current Market Outlook*, air traffic market is growing at 7.6 percent annually and is expected to be the largest commercial aviation market outside the US over the next 20 years, generating demand for more than 1,900 new jet airplanes worth US$165 billion. So far the PRC authorities have taken a conservative approach toward international aviation policy, defending the market share of domestic carriers—even at the cost of seeing the emergence of supply bottlenecks. They have also designated only one local carrier and one foreign carrier on any given route, and "strongly insist[ing] that commercial agreements be established before services could be launched" (Zhang and Chen 2003, 36). Moreover, to compensate at least in part to the fact that relatively few Chinese fly international routes, all government bodies strictly adhere to the "Fly Chinese" policy. All these sweeteners, however, have done little to increase the performance of the PRC companies to the international best practice, including in terms of safety and quality of services.

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[14] According to the National Bureau of Statistics of China (2004), aviation traffic volumes fell by 20 percent year-on-year in the six months to June 2003 against an 11 percent contraction for all modes.

Against this background, authorities are pushing for consolidation of the still fragmented industry, in the expectation that emerging "super-carriers" will increase their productivity and negotiate on an equal footing with foreign airlines. The fundamental problem is not small-scale, but poor management and excessive government intervention. The merger plan was announced in May 2001; a review was conduced by the State Council; and three new groups (Beijing-based Air China, Shanghai-based China Eastern Airlines, and Guangzhou-based China Southern Airlines) were established in October 2002. The three groups will take over 14 minor carriers, with all of them except Zheijiang and Yunan operating at least some regional cross-border flights. Among the 14 carriers are three that have municipal shareholders and operate independently of direct CAAC control, as well as six regional carriers that had previously formed their own alliance, the Sky Aviation Enterprise Group. China Aviation Fuel, China TravelSky, and China Aviation Supplies Import and Export were also set up as autonomous corporations in October 2002. The CAAC's duty becomes that of maintaining a fair market environment and protecting consumers' fundamental interests. Assets management is transferred to a special state-owned enterprises regulation department under the State Council.

The expectation was to integrate the financial structures by end-2003 and corporatize the carriers within three years. Analysts, however, doubt whether the new companies will be able to conclude the acquisition of the smaller carriers by December 2003 due to a shortage of funds (Lau 2003). More fundamentally, there is a risk that insofar as the new groupings are based on administrative preference and not market rules, the State Council's decision may turn out to be unviable (Dennis 2001). Other major aviation policy initiatives are a bold test-case "open skies" arrangement for the resort island of Hainan and domestic airfare reform, providing companies with enhanced tariff flexibility. Finally, the new civil-military coordination principle gives priority to civil aviation to ensure optimal civil operations, while providing concurrent consideration for military flights. The principle further states that military and civil air traffic coordination must meet the requirements of other flight activities, such as general aviation and sport flights.

In May 1994 CAAC announced that it would allow foreign investors to enter joint ventures with, or buy stock of, domestic airlines. A ceiling was set at 35 percent of capital and 25 percent of voting stock. The first, and indeed the largest, investment was George Soros' US$25 million acquisition of a 25 percent stake in Hainan Airlines in 1995.[15] By virtue of its non-CAAC status, Hainan hires foreign pilots and flight attendants, enjoys freedom in aircraft procurement, and fills a market, mainly tourist flights and feeder routes from smaller cities, which is different from those of the big three. Hainan net profit nearly doubled in 2002, lifted by greater domestic travel and strong expansion. Net earnings rose by 81 percent to US$21.9 million on revenue of US$608 million. With around 9 percent of the domestic market, however, Hainan is dwarfed by the big three and it is gunning for size. Hainan has bought three regional airlines, establishing six hubs across the country, including Beijing, Lanzhou, and Xian. This broadened Hainan's network to 300 different routes even as 60 percent of its flights do not go to Hainan at all. It also operates two regular international routes and runs four weekly charter flights to Kuala Lumpur. Hainan also runs a six-aircraft corporate jet subsidiary in Beijing; set up Yangtze River Express, the country's second air-cargo operator; and owns a majority stake in the Haikou airport (Dolven 2002).[16] In the earlier case of Air Lanka, as the foreign investor was another airline, competition policy issues could emerge. In the Hainan case, on the other hand, the question is what contribution a foreign non-airline investor can make in terms of productivity gains and competitive performance. *Prima facie,* the Hainan experience suggests that in the still relatively underdeveloped world of air transport in the PRC, nonairline investors can make a difference.

There are reports that the PRC's first private airline, Yinglian Airlines, is proposed to be set up in 2004 based in Chengdu, Sichuan, although it is not yet clear if it will be established independently of other airlines in the region (China Southern, Sichuan Airlines, and Air China). The CAAC has also said that it is considering three license applications for the "budget sector" and is said to be encouraging foreign investment in the sector (*People's Daily* 2004).

In summary, the PRC has continued to adopt a very conservative position in its international aviation policy, including a resistance to foreign direct investment. Despite the PRC's success in attracting very large volumes of FDI in other parts of its economy, in air transport a conservative international position is consistent with previous assessments of the international competitiveness of the local airlines (Oum 1998). That position is likely to change as comparative advantage shifts with growth. The PRC has introduced reforms in the domestic system that have led to higher levels of competition in those markets, and more recently to proposals for low-fare carriers. The introduction of domestic competition would have effects that spill over to performance in international markets. At the same time, the government in the past has attempted to manage the consolidation of carriers rather than leave that reorganization to the market.

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[15] Through successive share placements (and like the reduction in holdings of the original foreign investors in Virgin Blue), Soros' stake has fallen to 14.8 percent. China Eastern and China Southern, as well as Beijing Capital International Airport, have also issued shares on international capital markets—New York for the airlines, and Hong Kong, China for the latter. In February 2003, four foreign companies (DHL, Exel, United Parcel Service, Nissin Corporation) also took a 5 percent stake in the China National Foreign Trade Transportation Group, better known as Sinotrans. The deal, concluded on the debut of the H-share listing of Sinotrans, makes DHL the largest strategic investor in the PRC's biggest freight forwarder.

[16] At the time of writing, Hainan is in preliminary talks with Malev about taking a stake in Hungary's airline, with which it already operates a joint service between Budapest and Beijing.

B. Thailand

From the airline's inception in 1960 Thai Airways has been a source of national pride, its "smooth as silk" motto helping wing Thailand's aura as an exotic and world-class tourist destination. Mismanagement and operational inefficiencies, though, became an increasing drag on the national flagship. Thai provided cozy sinecures and excessive benefits to senior air force officials. And while early management expertise was provided by Scandinavian Airlines System, which held a 30 percent stake in 1959-1977, the constraints imposed by Thailand's bureaucracy limited the airline's options. The government did not shy from intervening in business decisions: in 1989, for example, it made Thai switch engines from General Electric models to Pratt & Whitney ones, believing the latter company closer to the US administration and therefore more willing to assist Thailand in its trade disputes with Washington (Bowen and Leinbach 1997). Although Thai's input costs were 52.1 percent lower than at American Airlines, efficiency was also 42.9 percent worse (Oum and Yu 1998).

In the mid-1990s senior executives went on a buying binge, amassing a fleet of aircraft guided more by hubris than strategic vision. When the domestic currency sank, dollar-denominated debt doubled in value, Thai's operating cost per unit of revenue rose to among the highest in the region, and passenger traffic dropped by 40 percent in the second half of 1997 (*The Economist* 1998). Although Thai returned to profitability in 2000, poor financial management led to a 17.5 percent jump in operating expenses, driven by higher maintenance and fuel costs. The company also appeared to fall behind terms of in-flight services quality. Short on cash, Thai shelved a US$100m upgrade scheme and thus lost the Asian business traveler, slipping down to a lower market segment. The entry of Singapore Airlines to the Star Alliance, of which Thai was a founding partner, also raised hackles.

Fixing the airline has become a tussle between two different models of reform: one that would require tying up with a foreign partner and another that seeks an in-house solution (Crispin 2001). The International Monetary Fund (IMF) rescue program prescribed that the government offload 23 percent of its 93 percent holding in Thai, earmarking a 10 percent stake for an outside strategic partner.[17] In March 2000 the government finally approved the sale of a 23 percent stake—13 percent to the public and employees and 10 percent to a foreign strategic partner. In the wake of the government's approval, transport minister Suthep Thaugsuban said the disposal would be completed before the end of the year (Regan 2000). The government of newly elected Prime Minister Thaksin Shinawatra shelved the IMF plan, opting to float shares only locally and handling organizational reform strictly in-house. Thai's home-grown reform plan, in effect, is the pilot project of the "Team Thailand" approach to modernizing the state sector.[18] A new Chairman, Chai-Anan Samudavanija, a respected academic and reform champion, was appointed. Thai wished to slash its public utility role, particularly in serving cash-hemorrhaging domestic routes, to allocate resources instead to more profitable long-haul international flights, to streamline the fleet, and to contract out non-core businesses. To trim its bulging debt-equity ratio to 3:1, Thai proposed to revalue assets. One of the main components of the restructuring is diminishing the Air Force's role in Thai, a politically sensitive and difficult business as the Air Force still effectively manages every operational division of the organization. Organized labor is a bigger obstacle. In 1999, unions blocked plans to spin off Thai's maintenance and computer divisions to an outside investor and reduce the workforce through early retirement schemes.

Despite frequent changes in management—Virabongsa Ramangkura replaced Chai-Anan Samudavanija in 2001, only to lose the chairmanship to Thanong Bidaya (also vice-chair of the Prime Minister's Council of Economic Advisers) in June 2002—the gradualist strategy has been a qualified success. Thai made a net profit of Bt10.2 billion (US$238 million) in 2002, compared with Bt1.9 billion the previous year, rising to Bt12.5 billion (US$299 million) in 2003. Thai is moving to enlarge its fleet by 16 aircraft between 2004 and 2006. To lower the debt-equity ratio and help raise new finance, new shares were issued (and the government sold down its holding) in November 2003 at Bt50 per share, a slight discount on the market price. The government shareholding fell from 93 to 67.8 percent. Foreigners now account for 20 percent of the shares (up from 1 percent), though no foreign airline ownership is apparent (*Airwise News 2003,* Thai Airways 2004).

In parallel to Thai's restructuring, there has also been some progress in deregulating and liberalizing civil aviation. Given a supply constraint, the aim was to ease the investment burden off the government's shoulders and to provide more convenient and comfortable air transport services. Angel Airlines (8G) was licensed as a second flag carrier for regional routes in September 1997 and started operating one year later. It currently operates scheduled flights from Phuket and Bangkok to Hong Kong, China; Macau; and Osaka, and is planning to build up connections with People's Republic of China. Other new entrants include Orient Thai Airways and the high-frills, high-price Bangkok Airways, South Asia's most successful small airline.[19] Following a reduction in some of its own secondary routes, Thai has also commenced code sharing with two domestic carriers, PB Air and Air Andaman, and is expected to conclude a similar agreement with Phuket Air. The government may grant Thai 50 percent control over the new Suwannaphumi airport, scheduled for completion in 2004, and recently approved Thai's plans to invest Bt13.74 billion (US$321 million) in six projects, including a catering complex and aircraft maintenance facilities. In order to boost tourist traffic, the government also launched an investigation in view of licensing a no-frills air shuttle service linking Phuket and Langkawi. Prime Minister Thaksin also announced a U$650 million plan to make the northern city of Chiang Mai an international aviation hub. The government opened talks with Singapore Airlines about establishing discount flights between Chiang Mai and Singapore.

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[17] The initial plan was to allow foreign ownership of up to 49 percent, but this conflicts with Thai law dictating that nationals must own no less than 70 percent in the national carrier (Li 1998).

[18] That approach in other economies, such as Malaysia and the Philippines, had not been successful. See *Far Eastern Economic Review* (2001).

Two important more recent developments have occurred in the low-fare sector. Malaysian low-fare operator AirAsia has formed a Thai operation that is owned 49 percent by the parent company and 51 percent (therefore meeting local rules on foreign ownership) by Shin Corp, a company founded by Prime Minister Shinawatra. In February 2004, the airline started flying from Bangkok direct to Singapore's Changi Airport (previously AirAsia had not used Changi Airport but had flown from nearby Senai Airport in Malaysia) and is now also serving routes within Thailand. Orient Airlines established a low fare subsidiary called One-Two-GO in December 2003 to operate on domestic routes (Orient flies on international routes to Hong Kong, China and Korea). Even more recently, Thai Airways has set up its own low-fare carrier called Nok Air. Thai Airways will hold 39 percent with a number of other Thai investors, including the local 7-Eleven company that will provide sales outlets. It will lease aircraft from Thai Airways and fly overlapping domestic routes starting from June 2004 (Thai Airways 2004).

In summary, recent developments in Thai policy have included the multiple designation of international carriers and the encouragement of new entrants into the domestic network, which has led to a surge of interest in low-fare operations. There have been a number of attempts to reorganize the financial structure of Thai Airways, including partial privatization. The initial preference was for an "in-house" solution but at the end of 2003 the extent of foreign participation (at least via portfolio investment) has increased. Other important issues in the future will be linkages between the airline and the provision of airport services at the major Thai hub.

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[19] Its passenger numbers almost quadrupled in the eight years to 2001 and profits rose to US$2.7 million in 2001, one third higher than the previous year. Foreign tourists make up over 90 percent of Bangkok Airways' customers. While most Asian airlines design their route maps around bulk traffic between big cities, Bangkok Airways uses small planes to take tourists exactly where they want to go. It has devised a circular route, for example, to usher sightseers through four big attractions in Cambodia, Laos, Thailand, and Vietnam, without stopping in a single capital city. In tourist destinations where there were no airports, such as Sukhothai or Ko Samui, a Thai beach resort, the airline has built one itself. See *The Economist* (2002).

C. India

Air India was set up by J.R.D. Tata, who ran it successfully until it was nationalized in 1953. In the 1960s the "Maharaja", as the national flag-carrier was affectionately known, was flying to 32 destinations (it now flies to 46 destinations) and making profits. In 1992 it posted profits of US$729 million, but then accumulated losses of nearly US$2 billion in 1995-1999. Problems included overstaffing and an ageing fleet caused by arcane policy regulations. First, the Contract Labour (Regulation and Abolition) Act 1970 and the Industrial Disputes Act 1947 prevented the company from outsouring its non-core activities and reducing workforce per aircraft. Second, Air India and Indian Airlines (the state-owned domestic carrier) are obliged to buy aviation turbine fuel from the government at prices that are a third higher than the international norm, and to pay a special tax that goes toward subsidizing domestic oil products such as kerosene (*Financial Express* 2001). Finally, the annual Haj pilgrimage flights and the use of two Air India planes (one aircraft is kept as a stand-by) for the Prime Minister's visits abroad are never compensated on commercial terms. In the case of Indian Airlines, it has to fly loss-making routes at low fares without receiving corresponding universal services subsidies—fares for the Northeast, in particular, are 35 percent lower than the actual cost of the service, causing the airline to lose €30m per annum (*Business India* 2001).

Domestic liberalization took off in 1986, with the launch of scheduled services by new start-up carriers from 1992.[20] A number of foreign investors took an interest, but they have all failed—not least because the law states that foreign ownership of up to 40 percent is only permitted to investors whose main business is not in air transport. Modiluft closed after failing to meet financial obligations to lessors and its technical partner, Lufthansa. In 1996-1998, Tata and SIA tried to launch a domestic carrier, but the civil aviation minister had publicly stated his opposition on numerous occasions (*Airline Business* 1998). Finally, Kuwait Airways and Gulf Air, which each held 40 percent of Jet Airways' stock, were forced to sell out to a nonresident Indian. Jet Airways, for its part, has been a great business success, becoming the largest domestic airline in August 2000 and expanding its fleet through leasing (*Business India* 2002). Jet and another private airline, Air Sahara, have more than half of the domestic market. Jet has requested authorization to fly from Chennai to Kuala Lumpur using India's untapped aviation rights. AirDeccan, a low-fare carrier based in Bangalore, was launched in late 2002. There are reports of two or more low-fare carriers starting soon (*Business Line* 2004).

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[20] It was only in 1994, however, that the Air Corporation Act of 1953 was amended, allowing the new companies to market their services as full-fledged airlines (and not as air taxi operators) and openly advertise their timetables.

The government set up a commission in February 1995 to make a comprehensive examination of the reasons for the losses of Air India and Indian Airlines. The December 1996 report recommended a two-phase strategy, to reduce government equity and inject fresh funds to acquire new aircraft. According to the terms of the policy announced in May 2000 to offload 60 percent of capital, a local strategic investor was being sought for a 40 percent stake, with the remaining 20 percent earmarked to retail investors and employees. The strategic investor might form a joint venture with a foreign airline but the latter would only be allowed to own a maximum of 26 percent of Air India. Under the shareholder's agreement, the chairman, managing director, and five board members were to be appointed by the strategic partner, with three directors being government appointees and four professionals. Although many Asian and European carriers were expected to make bids, only two bids were presented in May 2001, by the Tata Group with SIA and by Ashok Leyland, backed by the Hinduja brothers. The latter, however, was soon disqualified on the grounds of national security. The Communist Party expressed concerns at the possibility that Air India may be controlled by a foreign state-owned enterprise, while the Congress Party, the main opposition party, opposed privatization if there was only one bidder. Surprised by the intensity of political, union, and media opposition, SIA withdrew its planned bid on 2 September 2001 and, facing competing heavy investment in telecommunications and hotels, Tata took this as an ideal opportunity to pull out in December 2001. As the Hindujas had also bid for Indian Airlines, after government banned the sole remaining contender on economic grounds, the Cabinet Committee on Disinvestment decided in July 2001 to postpone both carriers' sales indefinitely.

While Indian Airlines remains a loss-maker, Air India just managed to come out of the red in 2001 after incurring losses for six consecutive years. Although the Ministry of Civil Aviation has maintained that fleet acquisition could not go hand in hand with the disinvestment process, capital shortages are hindering the state-owned carriers. In cargo, for instance, Air India's 40 percent network contraction saw its market share drop to 13 percent in 2001 (Matthews 2001). At London Heathrow, moreover, Air India has only been allocated slots for 11 of the 16 flights to which it is legally entitled. The paradox is that, as one quarter of the airline's revenue comes from the United Kingdom and the US, unless transatlantic traffic expands there is no justification for upgrading its ageing fleet. In September 2003, a committee set up to examine the plan to purchase 18 short-range single-aisle aircraft and 17 300-seaters rejected the request, arguing that Air India, because of years of neglect, no longer has the business class base to support the purchase of 777s or A340s.

Unable to fly to at least 19 of the 96 countries with which India has BASAs, Air India has signed different kinds of commercial arrangements that include block space agreement, code sharing, and revenue pooling. The Ministry is also inclined toward incorporating Air India in Star Alliance. Lufthansa, one of its founding members, is keen to extend its operations in Southern India (adding Cochin and Hyderabad to Chennai and Bangalore) and Star Alliance is reportedly keen on sourcing more information technology services from India. Lufthansa has in turn promised to provide an additional prime slot to Air India in Frankfurt. The direct interest taken by the Minister in the alliance decision, however, bears testimony to the obstacles that private, and foreign in particular, investors may have in investing in Air India. A new management committee structure has delegated a large number of executive responsibilities to a three-member committee comprised of the civil aviation secretary and the joint secretary and financial advisor in the ministry (who are not full-time directors of Air India) and the airline's managing director. Moreover, until recently the managing director only had a succession of short-term contracts, as opposed to an open-ended tenure. With such an incentive structure, a public sector executive is unable to show leadership and take quick decisions.

Civil aviation policy was reviewed by the Naresh Chandra Committee, which reported in December 2003. It proposed (reiterating earlier proposals) that the foreign equity limit be lifted to 49 percent and that foreign airlines be allowed to invest within this cap. It also proposed that international markets should be liberalized in two phases, the first in which private airlines in India be allowed to compete on routes to and from India, and the second in which "the government should seek more liberal arrangements under the bilaterals and enhance full access to wider market segments by joining a regional or a plurilateral group of countries with a similar agenda of liberalization" (Ministry of Civil Aviation 2003, 67). More recently, the government announced that it had approved the proposal for private carriers to fly to six other countries in South Asia, the first being Sri Lanka (approval from the other five was not yet obtained). In return, a number of restrictions on Sri Lankan (see Box 1) operations to India were relaxed, all of which will add to the competitive pressure on the government owned airlines.

Another important recent development is the Civil Aviation Ministry's decision to allow the private carriers, Jet Airways and Air Sahara, to continue carrying out their own ground-handling activities. Earlier, for security concerns the Union government had decided to restrict ground handling to Indian Airlines, Air India, and Airports Authority of India. Various foreign investors such as SIA, Lufthansa, and Swissport have come up with proposals for partnership with Air India in its proposed ground handling subsidiary. Permitting the domestic carriers to self-handle ground services, while disallowing international carriers, would be arbitrary and create operational problems.[21] An additional impediment in India to cheaper operations is airport charges, which were also stressed by the Naresh Chandra Committee. These charges are 40 percent higher than in Southeast Asia and 50 percent higher than in the Middle East, the civil aviation ministry is planning to allow the establishment of small airports that will not offer cargo or cold storage facilities, where parking times will be shorter, and charges lower than their bigger brethren.

Policy on ground handling is further complicated by a decision to privatize the Mumbai and Delhi airports (up to 74 percent to a private owner or a consortium). The Airports Authority of India would hold the balance and it is reported that the private operator would have the right to conduct ground handling services at the two airports. It is not clear whether the market for these services would be competitive. The Naresh Chandra Committee proposed to extend the airport privatization program.

In summary, attempts to privatize the airlines in India have stalled, and along with it foreign participation. Airlines in India concentrate on commercial agreements with other international carriers. However the private airlines at least within domestic routes have been growing rapidly and recently they have been given more rights to fly internationally. The introduction of private ownership of the airport infrastructure has served to highlight the issue of restrictions on the right to provide ground handling services.

IV. CONCLUSION

The Asian air transport system remains under pressure for change.[22] Key drivers include the demand side shocks associated with the 11 September 2001 events, the global economic slowdown, and SARS. On the supply side is the new competition from the low-cost carriers. While significant shifts in demand are a key feature of this industry, the supply side shock represents a significant and sustained change in industry structure. These pressures are now particularly acute—according to the IATA Director General the "air transport industry is going through its worst crisis since the Wright Brothers flew one hundred years ago. All continents are affected in one way or another by this crisis" (Bisignani 2003). Not all carriers are losing money, however, and the IATA Director

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[21] As noted earlier, ground handling services are not included in the list of services related to air transport to which the GATS applies.

[22] These trends were discussed at the Pacific Economic Cooperation Council meeting on regional air transport issues, held 5-6 September 2003 in Singapore.

General (Huttner 2003) continues to note the regional variations in financial performance and that traffic growth in Asia has been relatively high. In other regions, according to IATA, the financial situation of the carriers is more generally a problem and the global industry in 2001 and 2002 lost US$31 billion. As the rest of the world responds to these losses, new pressures for change will emerge in this region.

This paper has analyzed recent ownership trends in the air transport industry in developing Asia against the background of global regulatory trends. Although showing better financial performance than airlines in the North Atlantic, Asian carriers are also suffering from various exogenous shocks. The liberalization drive that has gained momentum since the mid-1990s, which is exemplified by more liberal BASAs, the emergence of low-cost carriers, and increasing competition between regional hubs, should be maintained.

As stressed in this paper, a pillar of the regulatory system is its rules on ownership and the restriction on foreign participation in particular. The case studies presented above show how change has occurred within national markets, and sometimes in international markets through the designation of new carriers, but that ownership rule restricts the adjustment options available. The rules on foreign participation may come under greater pressure to change as traditional full service carriers look for further finance while they work to respond to demand shocks and threats from competitors. Governments are unlikely to be able to fund the responses. Restrictions on ownership raise the cost of funds to the carriers involved and limit the scope for developing economies to capture the benefits of their comparative advantage in this service.

These rules discourage those economies from reducing protection for their carriers. Without the option of pursuing foreign investment to support the competitive performance of their airlines, investors, i.e., governments in all but a very few cases, rely instead on a combination of protection and budgetary support. Proposals for reform of ownership rules have been tabled by ICAO and options for routes to move to those new rules are worth further attention.

The studies of these issues in the aviation sectors of India, PRC, and Thailand highlighted a number of key points. First, greater competition has developed within domestic markets, including from privately owned airlines and especially from low-fare carriers. Domestic deregulation tends to precede market opening to foreign participation, but in the process reduces the capacity of incumbents with international networks to earn rents in their domestic routes. In the longer term, the emergence of new private carriers is likely to lead to further pressure for reform on international policy, for example the removal of any restrictions on their own participation in international networks.

Second, higher levels of foreign participation in airline operations would provide funding and management capacity that would support the adjustment process required in the incumbent carriers. There are however limits to this process according to the current international regulatory practice. The rise in foreign participation tends to be slow in traditional full-service carriers, but tends to occur more quickly (up to regulatory limits) in newly established low-fare carriers. The adjustment process may therefore take the form of the replacement of traditional incumbents by the new business models or variants of those models. Even though foreign investors hold a minority share in the low-fare carriers, they may have more confidence in the alignment of business interests with their other private sector partners working within the new business model. However, the "cookie cutter" approach of establishing separate businesses in different countries in order to meet regulatory requirements of each host economy is wasteful.

Third, the reform in the aviation markets tends to highlight remaining regulatory issues in markets for essential facilities to air transport, especially airport services. This attention includes not only the provision of ground handling but also an argument for a shift to greater private participation in airport investment and management. The trend in this direction in other developed and emerging economies, and the emergence of new private operators seeking investment opportunities, will lead to more attention to FDI policy in this activity as well, which will in turn require new regulatory capacity (for example, to respond to concerns about the abuse of market power by airport operators). However, a greater role for the private investment in airports, including via FDI, alongside new regulatory arrangements in that sector, will support the movement to regulatory reform in air transport services, since it will help remove what might otherwise become a new bottleneck.

REFERENCES

Airline Business, 1998. "Born Free." February.

Airlines International, 2003. "Supporting Sri Lankan." Geneva.

Airwise News, 2003. "Thai Completes Share Sale." 21 November. Available: http://news.airwise.com/stories/2003/11/1069412368.html.

Air Transport World, 2003. *World Airline Report 2003.* Available: www.atwonline.com/pdf/worldairlinereport-2002.pdf.

Association of Asia Pacific Airlines, various years. *AAPA Annual Statistical Report.* Kuala Lumpur, Malaysia.

Allen, G. C., and A. G. Donnithorne, 1954. *Western Enterprise in Far Eastern Economic Development. China and Japan.* London: George Allen & Unwin.

Backx, M., M. Carney, and E. Gedajlovic, 2002. "Public, Private and Mixed Ownership and the Performance of International Airlines." *Journal of Air Transport Management* 8:213-20.

Bisignani, G., 2003. "Seeking a New Way." Paper presented at the ICAO Pre-Conference Seminar, International Civil Aviation Organisation, Montreal, 22 March.

Boeing, 2002. *China Current Market Outlook.* Chicago, Illinois.

Bowen, J., and T. R. Leinbach, 1997. "Development and Liberalization: The Airline Industry in ASEAN." In G. C. Hufbauer and C. Findlay, eds., *Flying High. Liberalizing Civil Aviation in the Asia Pacific.* Institute for International Economics, Washington, D.C.

British Broadcasting Corporation, 2002. 16 October.

Business India, 2001. "Videocon Edges Ahead." 16 April.

———, 2002. "No Time to Splurge." 28 October.

Business Line, 2004. "As Low Cost Airlines Take off...Asian Skies Readying for the Dog Fight." 19 January. Available: http://www.thehindubusinessline.com/2004/01/19/stories/2004011900120600.htm

Chang, Y-C., and G. Williams, 2001. "Changing the Rules—Amending the Nationality Clauses in Air Services Agreements." *Journal of Air Transport Management* 7:207-16.

Crispin, S., 2001. "Thai Airways Goes It Alone." *Far Eastern Economic Review*. 26 July. Pages 44-8.

Dennis, W., 2001. "China Begins Second Round of Airline Consolidation." *Aviation Week & Space Technology* 155(25):90.

Dolven, B., 2002. "The Best Little Airline in China." *Far Eastern Economic Review*. 17 January. Pages 32-6.

Doove, S., O. Gabbitas, D. Nguyen-Hong, and J. Owen, 2001. Price Effects of Regulation: Telecommunications, Air Passenger Transport and Electricity Supply. Staff Research Paper, Productivity Commission, Canberra.

The Economist, 1998. "That Sinking Feeling." 17 January. Pages 57-8.

———, 2002. "Rolling out the Red Carpet." 5 September. Page 76.

———, 2003a. "A Bet on the Future." 4 October. Page 80.

———, 2003b. "Open Skies and Flights of Fancy." 4 October. Page 80.

Ergas, H., and C. Findlay, 2003. "New Directions in Australian Air Transport." *Agenda* 10(1):27-42.

Financial Express, 2001. "A-I Submits VRS Proposal for Cabinet Okay." 16 April.

Findlay, C., 2003. "Plurilateral Agreements on Trade in Air Transport Services: The US Model." *Journal of Air Transport Management* 9:211-20.

Findlay, C., and D. Nikomborirak, 2003. "Liberalization of Air Transport Services." In W. Martin and M. Pangestu, eds., *Options for Global Trade Reform: A View from the Asia-Pacific*. Cambridge: Cambridge.

Findlay, C., C. L. Sien, and K. Singh, eds., 1997. *Asia Pacific Air Transport: Challenges and Policy Reforms*. Institute of South East Asian Studies in conjunction with Australia-Japan Research Centre (AJRC), Singapore National Committee for Pacific Economic Cooperation (SINCPEC), and the Chartered Institute of Transport (CIT), Singapore.

Goldstein, A., 2003. "Integration, Investment, and Competition in Southern Africa: The Case of Air Transport." In D. Hansohm et al., eds., *Monitoring the Process of Regional Integration in SADC*. Windhoek: Gamsberg Macmillan.

Gonenc, R., and G. Nicoletti, 2001. "Regulation, Market Structure and Performance in Air Passenger Transportation." *OECD Economic Studies* 32:183-227.

Gudmundsson, S. V., and D. L. Rhoades, 2001. "Airline Alliance Survival Analysis: Typology, Strategy and Duration." *Transport Policy* 8(3):209-18.

Huttner, D., 2003. "No Frills, Smaller Bills." *Far Eastern Economic Review*. 10 July. Page 32.

ICAO, 2002. *Annual Report*. International Civil Aviation Organisation, Montreal.

———, 2003. "Annual Civil Aviation Report." *ICAO Journal* July/August. International Civil Aviation Organisation, Montreal.

ICTSD, 2004a. *Bridges Weekly Trade News Digest* 8(13). 8 April. International Centre for Trade and Sustainable Development, Geneva. Available: http://www.ictsd.org/weekly/04-04-08/BRIDGESWeekly8-13.pdf.

———, 2004b. *Bridges Weekly Trade News Digest* 8(27). 3 August. International Centre for Trade and Sustainable Development, Geneva. Available: http://www.ictsd.org/weekly/

Lau, J., 2003. "CEA to Buy 22 Aircraft." *Financial Times*. 27 August. Page 18.

Li, M. Z. F., 1998. "Air Transport in ASEAN: Recent Developments and Implications." *Journal of Air Transport Management* 4(3):135-44.

Mathews, N., 2001. "India's National Carriers Ring Up 'No Sale' for New Aircraft." *Aviation Week & Space Technology* 154(16):72.

Ministry of Civil Aviation, 2003. "Report of the Committee on a Road Map for the Civil Aviation Sector." Available: http://civilaviation.nic.in/moca/nccommittereport.pdf.

National Bureau of Statistics, 2004. "Statistical Data." Available: http://www.stats.gov.cn/english/statisticaldata/index.htm.

Oum, T. H., 1998. "Overview of Regulatory Changes in International Air Transport and Asian Strategies towards the US Open Skies Initiatives." *Journal of Air Transport Management* 4(3):127-34.

Oum, T. H., and C. Yu, 1998. *Winning Airlines: Productivity and Cost Competitiveness of the World's Major Airlines.* Boston: Kluwer Academic Publishers.

People's Daily, 2004. "China's First Private Airline to Make its Debut this Year." Available: http://english.peopledaily.com.cn/200402/06/eng20040206_134060.shtml.

Regan, J., 2000. "Don't Hold Your Breath for Thai Airways Sale." *Finance Asia.* 21 March.

Rose, E., 2004. "Reworking the Model." *Airline Business.* March. Pages 58-60.

SJ Associates, 2001. *World Bank Impact Study of Infrastructure Privatisation in Sri Lanka.* Colombo.

Thai Airways, 2004. *1Q 2004 Analyst Briefing.* Available: http://www.thaiair.info/fpi-press-en.htm.

World Trade Organization, 2001. "WTO Addresses Developing Country Concerns in Tourism Symposium."
Available: http://www.wto.org/english/tratop_e/serv_e/symp_tourism_serv_feb01_e.htm.

Zhang, A., 1998. "Industrial Reform and Air Transport Development in China." *Journal of Air Transport Management* 4(3):155-64.

Zhang, A., and H. Chen, 2003. "Evolution of China's Air Transport Development and Policy towards International Liberalization." *Transportation Journal* 42(1):31-49.

Regional Integration and Benefits from Foreign Direct Investment in ASEAN Economies: The Case of Viet Nam

HAFIZ MIRZA AND AXÈLE GIROUD

In recent years Viet Nam has been pursuing the twin goals of promoting inward foreign direct investment (FDI) and regional development in the context of the Association of Southeast Asian Nations (ASEAN). The paper surveys transnational corporations (TNCs) with operations in ASEAN, and finds that Viet Nam has now largely achieved its initial objective of being a major FDI recipient. The regional aspect is especially manifest in consumer electronics, although most subsidiaries in Viet Nam still perform assembly-type operations oriented toward the local market. This has to change if Viet Nam is to maintain its development momentum. Under the threat of international competition and in order to maximize the dynamic gains from FDI, Viet Nam has to reorient its policies and emphasize a shift toward targeting efficiency-seeking investments and developing more advanced links with TNC regional and global value chains. This new approach would benefit from a full-scale development of the ASEAN Free Trade Area (providing access to a regional market) and the ASEAN Investment Area (securing capabilities in Viet Nam and other ASEAN countries), as well as other regional trade and investment initiatives.

I. INTRODUCTION

Perhaps the most compelling reason for the Association of Southeast Asian Nations (ASEAN)[1] to cooperate in promoting inward foreign direct investment (FDI) is the need to enhance individual country and regional competitiveness through cooperation, thereby promoting ASEAN as an investment region—

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[1] ASEAN consists of ten member countries. The earlier member countries are Brunei, Indonesia, Malaysia, Philippines, Singapore, and Thailand. Cambodia, Lao People's Democratic Republic (Lao PDR), Myanmar, and Viet Nam (the "new" members) joined from the mid-1990s.

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a regional model of attracting foreign direct investment. A linked reason is that, because of the region's integration process, it is natural to include investment given that trade arrangements and other aspects of economic cooperation are already part of the region's integration agenda. Clearly investment cooperation is a subset of a larger set of regional integration arrangements, but one that can help strengthen the overall integration process. The value of these arrangements, however, depends on the degree to which FDI and transnational corporations' (TNCs) regional operation strategies are centered on (or are evolving toward) using combined regional locational advantages (differential levels of resources, human capital, cheap labor, and markets in an area of 450 million people) to create value chains across the region (and beyond).[2]

This paper addresses two issues. First, it assesses the extent to which Viet Nam, as a new member of ASEAN,[3] has been drawn into the trade and investment nexus in Southeast Asia and, in particular, the regional and global value chains established by TNCs (Section III). Second, it assesses whether Viet Nam should deepen and widen this process, in order to potentially secure greater net gains from inward FDI; and, if so, how should it proceed (Section IV). These two issues are analyzed using both secondary data and some of the results of a recent research project called the Bradford study, conducted by the authors and other colleagues (Mirza et al. 2003), one aim of which was specifically to look at the lessons for the newer ASEAN member countries based on experiences of the older member countries. The Bradford study's methodology is introduced in the next section, prior to the analyses for Viet Nam in Sections III and IV. The final section concludes with implications and policy recommendations.

II. PROJECT METHODOLOGY

Foreign direct investment impacts on the growth and development of host countries in a variety of ways (UNCTAD 1999, Giroud 2003), ranging from "direct effects" on employment and training; through classical "multiplier effects" (e.g., workers use their wages to buy goods, which stimulates other industries) to

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[2] The "AFTA effect" has also eased the trend toward greater investment cooperation. The ASEAN Free Trade Area allows a member country with a restrictive investment regime to still be serviced through trade routes by a TNC producing in another country and exporting to the former. Under such conditions, the economic argument for protecting or restricting investment flows to a certain industry or country becomes weak. If an industry or a country's market can be serviced through trade routes then there is little point in restricting FDI flow. This realization has made ASEAN countries more receptive toward investment cooperation.

[3] In this respect, this analysis on Viet Nam could also be extended to other new ASEAN member countries (albeit there are significant differences between Cambodia, Lao PDR, Myanmar, and Viet Nam); and, possibly, countries joining other established regional groupings.

"spillover" effects whereby indigenous firms acquire knowledge and technology from foreign firms through a variety of transmission mechanisms (for further discussion of these effects, see Section IV.C). In this context, the ASEAN region is a prime target for investigating FDI impact because it has been a major and successful recipient of investment by TNCs for three decades, albeit the scale of inward FDI flows has declined in recent years. This was the fundamental justification for the Bradford study. One of the prospects afforded by looking at FDI in ASEAN as a whole was the opportunity to examine how the regional aspect impacted on newer member countries such as Viet Nam, both in terms of direct economic consequences (such as incorporation into the regional value chains of TNCs) and indirect benefits, principally, as the project was designed, with regard to the lessons that could be learned from the experience of older member countries.

The Bradford study was divided into two parts. The macro part was an econometric assessment of the *degree* to which FDI has resulted in growth and poverty reduction in ASEAN countries. This part of the study will be alluded to in Section IV,[4] but the main focus of the present paper will be on the micro part of the Bradford study, which examined the *detail* of FDI impact by interviewing top executives at TNC subsidiaries in a number of ASEAN countries. The principal issues discussed in the interviews included the overall scale and configuration of subsidiary activity, international and regional integration, the subsidiaries' role in the local economy, human resource development, and future intentions in ASEAN. Both objective and subjective data were collected. Operational data were collected, some from secondary sources.

The Bradford study used a semistructured questionnaire to interview managers in five ASEAN countries, namely Cambodia, Malaysia, Singapore, Thailand, and Viet Nam. The questionnaire was structured in the sense that it was very detailed and had about 60 principal questions, with a number of subquestions and options. However, the interviewees were given the opportunity to mention, discuss, and elaborate on issues beyond the strict rubric of the formal questions (hence "semistructured"). A number of variants of the questionnaire were used, especially for Singapore where most firms interviewed were regional headquarter companies (RHQs). The firms selected for interview were chosen using the following criteria:

(i) *Industry:* Firms engaged in electronics/electrical and garments/textiles products (a few firms in other industries were selected as a control group and by way of comparison).

(ii) *Origins:* Non-ASEAN TNCs, ASEAN TNCs, and indigenous firms (the indigenous companies represented both a control group and a way of comparing competitors—and thereby competitive effects—in selected products).

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[4] See Mirza et al. (2003, section 3) for a full discussion of the findings of the micro study.

(iii) *Size:* Appropriate levels of small to large measured by number of employees and capital.

(iv) *Locations:* Penang, Kuala Lumpur, and Selangor (Malaysia); Central Region, including Bangkok (Thailand); Hanoi and Ho Chi Minh City (Viet Nam); Phnom Penh (Cambodia); and Singapore. These choices reflect the location of significant numbers of firms, sites of partner institutions, and practical issues.

A mix of stratified and purposive sampling was used. The proportions of firms selected by industry, source etc. thus reflect the size and rankings of TNC activity in most respects in each host country. The number of firms interviewed in each host country was based on (i) the relative size of FDI in each country; (ii) the time available for fieldwork and other resources; and (iii) other considerations, e.g., the fact that Singapore was in the frame mainly because it was host to most RHQs in ASEAN. The interviews took place during a number of field trips made by the researchers over about a year from late 2001 to the start of 2003. The interviews were, normally, two to two-and-a-half hours in length, though a small number were shorter and some much longer. The number of interviewees varied, but in most cases the chief executive officer, managing director, or equivalent top executive with a sufficient oversight of the subsidiaries' overall activities participated in the interview.

A total of 113 companies were interviewed. A number of these companies were "pure" RHQ firms, i.e., they had no manufacturing activities whatsoever (although others were also engaged in manufacturing). In addition 10 companies interviewed were indigenous firms (normally direct competitors with one or more TNC subsidiaries in the sample), and for comparison, some firms came from other industries (e.g., two automakers in Thailand). Table 1 indicates the main characteristics and most of the quantitative information of 88 manufacturing companies in the five host countries and four industries surveyed. The subsidiary companies interviewed are dispersed by source, although most are from Europe; Japan; Taipei,China; and United States (US), in line with the overall shares of inward FDI by source in ASEAN. Most companies were established before 1996, which means that the companies interviewed have been some time in ASEAN and about a half of the parent TNCs have more than one subsidiary in the host country in which the interview took place. In other words there is a reasonable history, experience, and scale to the investments.

Viet Nam is used as a suitable case study in this paper because the sample size is reasonable. Twenty-five percent of the subsidiaries interviewed are in Viet Nam. Meanwhile, because a similar number of firms were interviewed in Malaysia and Thailand (31 and 28 percent respectively), some useful comparisons and assessment of lessons from the ASEAN experience can be made for Viet Nam. Malaysia and Thailand also represent the closest models in ASEAN for new member countries such as Viet Nam to follow and can be regarded as "exemplars." Both countries resemble Viet Nam in many respects, especially Thailand, in terms of development and economic characteristics (e.g., a substantial initial pool of trained and untrained labor). Both are not "too" far ahead in terms of GDP

Table 1. **Characteristics of Interviewed Manufacturing Companies (N=88) by Country of Ownership, Destination, Period of Establishment, and Degree of Parent Company Involvement**

Characteristic		Respondents (percent)	Comments
Country of Origin (number of firms and percent)	US	12 (14%)	Concentrated in Malaysia (7 out of 12)
	Japan	27 (31%)	Fairly equally dispersed between Malaysia (10), Thailand (9), and Viet Nam (7)
	Europe	11 (12%)	Biggest number in Malaysia (5)
	Taipei,China	11 (12%)	Fairly equally dispersed between Malaysia (2), Thailand (4), Viet Nam (3), and Cambodia (2)
	Hong Kong, China	8 (9%)	Fairly equally dispersed between Thailand (3), Viet Nam (2), and Cambodia (2)
	Singapore		
	Korea, Rep. of	4 (4%)	Entirely in Cambodia (3) and Viet Nam (1)
	Malaysia	6 (7%)	Biggest number in Viet Nam (3)
	Other	2 (2%)	Both in Viet Nam
		7 (8%)	Biggest number in Thailand (4)
Host Country	Malaysia	27 (31%)	Mostly in EE (18) and CE (7)
	Thailand	25 (28%)	Mostly in EE (16) and CE (5)
	Viet Nam	22 (25%)	Mostly in CE (8) and G (8)
	Cambodia	11 (12%)	Entirely in G (11)
	Singapore	3 (3%)	Entirely in EE (3)
Date Firms Started Operations (number/ percent)	Before 1980	14 (16%)	67% of firms in Singapore commenced operations before 1980; 33% in Malaysia
	1980-1985	8 (9%)	16% of firms in Thailand commenced operations
	1986-1990	20 (23%)	Big growth years in Malaysia (37% established in this period) and Thailand (36%)
	1991-1995	19 (22%)	Growth years in Thailand (16%), Viet Nam (45%), and Cambodia (27%)
	1996-2000	19 (22%)	Growth years in Thailand (16%), Viet Nam (27%), and Cambodia (54%)
	2001 or 2002	8 (9%)	Continuing expansion in Viet Nam (23%) and Cambodia (18%)

continued.

Table 1. *continued.*

Characteristic		Respondents (percent)	Comments
Mean Ownership Share (percent)		86%	Most companies (57) are wholly owned by the foreign company; only 9% are minority owned. The mean ownership by source country in reverse order is: Europe (99%), US (94%), Japan (84%), NIEs (82%); ASEAN (77%); Other (77%)
Number of Companies Owned by Foreign Parent in Host Country	1	47	Nearly a half of parent companies have additional companies in the host country in which they are invested. This is the case for more than a half of Japanese parents (17 out of 27). Multiple companies are more common in Malaysia (17 out of 27) and Thailand (16 out of 25), reflecting longer periods of establishment.
	Over 1	41	

Note: CE = Consumer Electronics; EE = Electrical and Electronics; G = Garments; T = Textiles; NIEs = Newly Industrialized Economies (Hong Kong, China; Republic of Korea; Taipei,China).
Source: Mirza et al. (2003).

per capita or other unique characteristics (unlike Brunei and Singapore). Malaysia and Thailand also possess substantial FDI in a range of industries, a path that Viet Nam is emulating, as Section III shows (unlike Cambodia, Lao PDR, and Myanmar, the other new ASEAN member countries). Finally, both Malaysia and Thailand are relatively successful in attracting, retaining, and benefiting from FDI (unlike, certainly recently, Indonesia and the Philippines).[5]

III. INTEGRATION OF TNCS' REGIONAL AND GLOBAL PRODUCTION NETWORKS IN ASEAN

The influence of TNCs on ASEAN's development is undeniable, not only because of the activities they conduct within each individual country, but also through their regional and international network of internalized and externalized relationships. In this section, we look at the connections between the organizational and geographical dimensions of activities of TNCs located in the five countries under study, taking regional and global dimensions into consideration. When considering TNCs' geographic configuration in ASEAN, one needs to understand different locational advantages that a country may offer, which might explain the dispersion of TNCs' functional activities, as well as the complex interrelationships established between various entities of the same company. External relationships are also substantial across the region, even though the boundaries between activities internal and external to the firm have become blurred (Dicken and Malmberg 2001). Transnational companies have created a web of relationships with suppliers and customers throughout the region, thus further contributing to the development of regional firms and strengthening the activities of foreign firms established in ASEAN.

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[5] See Mirza et al. (2003) for further a comparison of Viet Nam with the other ASEAN economies.

Because countries in ASEAN show varying levels of development and locational advantages, their experiences with TNCs activities differ. For instance, Viet Nam started welcoming FDI later than some of its neighboring countries. While early investment in ASEAN tended to be production-related to take advantage of the low-cost labor in the region, by the 1990s, many subsidiaries in the region have strengthened their capabilities and became centers of excellence, moving toward more technology-intensive activities in some sectors. Recently, TNCs have started to integrate their operations worldwide and concentrate activities in well-selected locations. The process of integration among these key locations within the overall global value chain is key to TNCs' competitiveness. In ASEAN, integrated plants are now replacing screwdriver plants, which previously received semifinished parts from parent companies for assembly. Integrated plants either produce parts and components in-house, or purchase them from sister companies or local producers in the region, thereby creating a complex network of internal and external relationships.

These recent trends can be summarized, first, by the fact that TNCs selectively locate specific subsidiaries across ASEAN depending on the locational advantages of host economies (e.g., factors appropriate to particular functional areas); and second, by the intricate internal and external relationships created on a national and regional basis, as well as corporate global links. These regional links have been formed over time, with a hierarchical nature of inward investment starting with Singapore, followed by Malaysia, Thailand, and Indonesia; and finally countries newly opened to FDI, such as Viet Nam. Market penetration reflects this pattern, with companies gradually enhancing subsidiaries' activities in more developed countries of the region. For this reason, numerous TNCs have located their RHQs in Singapore (Airriess 2001). In the electronics sector, some subsidiaries have opened research and development (R&D) centers in Malaysia and Thailand.[6] Companies in the survey discussed a gradual development from being purely manufacturing subsidiaries until small production-related R&D centers could be developed in-house. The type of activities conducted in subsidiaries in Viet Nam, and even more so in Cambodia, however, remain basic assembly-type operations. In parallel to the specificities of activities in individual countries, business networks by TNCs have developed over time across the region. For instance, many RHQs located in Singapore maintain strong relationships with other subsidiaries of the same company in the region, because they often oversee activities such as supply and marketing. This regional orientation of firms and subsequent creation of networks is well documented in the literature, particularly in the electronics industry (UNCTAD 1993, Dobson and Chia 1997, Borrus et al. 2000, Legewie and Meyer-Ohle 2000, Sturgeon 2002, Giroud 2004). TNCs upgrade their technologies in certain subsidiaries, which might be beneficial to other subsidiaries in the region, as is the case for Japanese electronics firms in East Asia (Song 2002), and companies in the automobile industry (Japan Research Institute Limited 2001). The subsequent investment pattern is beneficial for host countries' development (Ito and Krueger 2000). While the development of regional production networks has been observed and studied in the case of the electronics sector in Asia (see for instance Wong 1997, Richter 1999, Borrus et al. 2000), the configuration of the production chain in the textiles and garment sectors differs. The garments industry remains more fragmented organizationally and is less sophisticated technologically than the textiles industry (Dicken 2003, 318); and neither industry portrays a regionalization of operations within Southeast Asia akin to that witnessed in the electronics industry. The textiles and garments industries are dominated by international subcontracting arrangements; additionally, the production chain is fragmented according to materials, processes, and end uses, each of which is often located in various parts of the world, depending on the level of development of countries. In Southeast Asia, manufacturing in the sector is highly labor-intensive, particularly so in newly developing economies such as Viet Nam. In choosing locations, companies pay attention not only to low labor costs, but also to orientation of specific markets and international trading agreements. Some regional production networks within Southeast Asia do occur, largely thanks to the investments made in Cambodia and Viet Nam by companies originating from Indonesia, Malaysia, Singapore, and Thailand.

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[6] This partly makes up for the fact that foreign firms appear to undertake less R&D than local firms, as in the case of Thailand (ADB 2004, 228).

In line with the emergence of regional production networks by TNCs, recent trends in FDI and trade indicate how closely integrated economies in Southeast Asia have become, particularly so in Viet Nam. Intra-ASEAN investment flows represent a mere 10 percent of overall flows in the region (see Table 2). Thus, the share of intraregional investment within total inflows in ASEAN countries remains limited, but increased to 17 percent in 2002 (UNCTAD 2003, 46), reflecting the continuing improvement in the private sector's recovery from the Asian crisis and deepening regional integration. Flows of FDI to ASEAN have increased particularly after the signing of AFTA. The experience of individual economies within this regional integration differs widely. Viet Nam, for instance, distinguishes itself inasmuch as over one fifth of investment inflows are intraregional flows. Viet Nam is attractive because of its large population, political stability, and diversified industrial base. The majority of intraregional inflows originate from indigenous firms and foreign firms based in Singapore, Malaysia, and Thailand. Overall, over two thirds of all investment inflows in Viet Nam comes from East Asia (ASEAN; People's Republic of China [PRC]; Japan; Republic of Korea [Korea]; Hong Kong, China; and Taipei,China), and over 90 percent of manufacturing FDI comes from companies based in East Asian economies. Viet Nam's clear regional integration with neighboring countries and other Asian countries reflects the nature of the global and regional economy into which the country emerged in the 1990s (Krumm and Kharas 2003), attracting both East Asian TNCs and non-Asian TNCs located in countries in the region and integrating Viet Nam within their regional operations.

Table 2. **Foreign Direct Investment Flows in ASEAN (BOP Basis, US$ million, and percentages)**

	As Host Countries						**As Home Countries**	
	Total Inflows (1995)	**Intra-Regional Flows (share of total)**	**Total Inflows, 2001**	**Intra-Regional Flows (%)**	**Total Inflows, 1995-2001**	**Intra-Regional Flows (%)**	**Total Outflows to other ASEAN, 1995-01**	**Share in Intra-ASEAN Inflows**
Brunei	582.76	53.42	526.44	2.01	4,334	30.1	244.12	1.60
Cambodia	150.70	-	112.90	-	1,101	-	5.79	0.04
Indonesia	4,346.00	14.01	(3,278.53)	(7.32)	4,288	3.2	1,179.13	7.73
Laos	88.40	7.39	23.90	12.80	458	54.5	10.03	0.07
Malaysia	5,815.00	28.83	553.95	14.44	12,264	19.7	2,190.48	14.36
Myanmar	317.60	30.45	192.01	35.08	3,164	31.1	19.21	0.13
Philippines	1,577.00	15.32	1,049.00	21.19	10,115	10.1	236.32	1.55
Singapore	9,686.20	8.21	8,583.10	(2.02)	66,142	4.2	9,936.68	65.13
Thailand	2,004.04	8.01	3,780.45	42.49	28,545	13.6	1,419.83	9.31
Viet Nam	1,780.40	21.75	1,300.27	18.57	11,944	20.0	15.12	0.10
Total ASEAN	23,540.09	14.94	10,352.17	9.01	142,358	10.7	15,256.71	100.00

Note: Figures for Malaysia include reinvestment earnings; figures for 1995-2001 include total cumulative figure, and excludes data on FDI in Cambodia.

Source: ASEAN Secretariat.

The country-specific advantages presented by Viet Nam has allowed it to distinguish itself from other countries in the region, and it has succeeded in attracting substantial investment, following a path similar to that experienced by Malaysia and Thailand in the early 1990s. Viet Nam established itself as a major host by attracting more investment than other emerging economies in the region in the late 1990s, overtaking Indonesia and the Philippines. By 2002, Viet Nam was the third largest recipient of FDI flows in ASEAN, behind Singapore and Malaysia, strengthening its position as a significant investment base (UNCTAD 2003). Viet Nam has therefore achieved a key position both in terms of prime investment host within the region, and as a recipient of intraregional inflows. The case of Viet Nam also stands out because its economy is interlinked with that of neighboring economies through intraregional trade (Sakakibara and Yamakawa 2003b). Asia as a whole represents 42 percent of Viet Nam's total merchandise exports and 78 percent of the country's merchandise imports (ADB 2003).

Singapore is a key partner to Viet Nam, second to Japan in terms of export and first in terms of imports. Viet Nam's export success is due, to a large part, to its textiles and garment industry (Hill 2000), and has mostly occurred after the *Doi Moi* reform process (Cooper 2002, Gates 2000). Regional integration through trade has taken place throughout ASEAN. Intraregional exports doubled during the last decade, up from over US$43 billion in 1993 to over US$70 billion in 1995 and US$84 billion in 2001. Similarly, intraregional imports have nearly doubled, from US$37 billion in 1993 to US$53 billion in 1995 and US$38 billion in 2001. (There has been a recent reversal, however, which probably will not be permanent; see Section IV.B.)

At a firm level, the Bradford database (Mirza et al. 2003) allows analysis of the integration of TNCs' activities internationally and regionally. In terms of scale of activities, subsidiaries had on average more factories in Malaysia and Thailand (2.19 and 2.36 factories, respectively). The smallest number of factories was found in Singapore where companies did not necessarily have a factory, but where operations were sometimes purely administrative. Similarly, the largest factories (in terms of number of employees) were found in Malaysia and Thailand. Subsidiaries in the electrical and electronics industry and in the textiles industry are larger than those in the garments industry. Although more than a third of companies in the sample subdivide activities worldwide on a regional basis, only 14 subsidiaries mentioned that their parent company considered ASEAN as a distinct region. Of these, 12 had their RHQs located in Singapore.[7] Many companies include ASEAN within a wider regional context, and include other Asian and Pacific countries in their subdivision of operations. Out of 55 firms with operations in more than one ASEAN country, 31 indicated a moderate to very close integration of activities across regional operations. Regional integration is highest in the case of companies with their headquarters in ASEAN (average integration in this case is 4.5 on a scale of 5), and is the lowest for companies with their headquarters in other East Asian economies or Japan. When it comes to roles of subsidiaries and their capacity to interact with sister companies, firms in the electrical and electronics sector often have a key strategic role, whereas this is less the case in the garments and textiles industries. Slightly more than half of the TNCs in the Mirza et al. (2003) study are manufacturing platforms and perform no other strategic function. These subsidiaries are closely dependent on their parent firm and/or the RHQs for strategic decisions. Over two thirds of subsidiaries in the textile and garment industry have no strategic role and merely manufacture the goods, against only two fifths in the electrical and electronics industry. In line with the investment and development path, only 40 percent of subsidiaries in Malaysia and Thailand solely perform manufacturing activities. One fifth of subsidiaries in these two ASEAN countries have in-house R&D facilities, and in Malaysia another fifth are completely autonomous subsidiaries. The picture is very different in Cambodia and Viet Nam, where over three quarters of subsidiaries only perform a pure manufacturing base function. Looking into the range of activities and integration on a regional basis highlights the different levels of development and investment experience. Singapore has undoubtedly established itself as a developed economy and attracts high value-added activities. Many subsidiaries in Malaysia and Thailand have succeeded in establishing themselves as centers of excellence within their company's global activities. Subsidiaries in Viet Nam and Cambodia remain manufacturing platforms. Yet, as mentioned above, Viet Nam is following Malaysia and Thailand closely and is fast becoming a major investment recipient in the region, because of its country-specific advantages, recent international trading agreements, and regional integration.

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[7] Singapore is attractive to higher value-added type of activities and hosts many of the RHQs in the region.

Regional integration further occurs through trade, and Table 3 illustrates trade patterns by subsidiaries on a global and regional basis. Figures indicate where subsidiaries' outputs are sold and where their inputs originate. The geographical destination and origin are presented as a share of total exports or imports and local trade is taken into consideration, showing the depth of relationships established by subsidiaries within host economies. Overall, 28 percent of outputs from subsidiaries in ASEAN is sold in the local market, and just over a quarter of all inputs are purchased locally.[8] By combining shares of the local market and ASEAN, it appears that only 35 percent of output manufactured by foreign subsidiaries remains in the region, and even then part of this is aimed at companies that will integrate the input to export the final products to markets outside of ASEAN. The major markets for products are the developed markets of Europe, Japan, and North America. Slightly more regional integration takes place in terms of input, as overall 39 percent originate from either the local market or regional markets. In this case, nonregional imports originate primarily from neighboring East Asia and Japan. This reflects the position of subsidiaries in ASEAN within the global chain of activities of their firm, with strong dependence on Asia for the upstream activities and final markets primarily in the West.

Taking the specific case of Viet Nam allows analyzing trends in more detail. Viet Nam differs from Malaysia and Thailand in the configuration of subsidiaries' activities. First, as much as 40 percent of foreign subsidiaries' output is sold locally in Viet Nam, while the shares are lower for the other two countries. Second, foreign subsidiaries in Viet Nam rely less on local supplies than their counterparts in Malaysia and Thailand, but import more from neighboring ASEAN countries. These trends reflect the low level of component production in Viet Nam, the market orientation of some foreign firms in the country, and the nature of the textile and garment industry (as half of the firms in the sample are in this industry). The regional dependence of foreign subsidiaries in Viet Nam for their upstream activities shows that the major sources of imports are East Asia (30 percent of inputs), Japan (14 percent), and ASEAN (23 percent). East Asia is a significant source of inputs for Cambodia and Thailand; while local/ASEAN inputs are more important for Singapore and Malaysia. Viet Nam is balanced in terms of the proportion of ASEAN and East Asian inputs, probably because it is a major site for cheap but skilled labor for export-oriented industries of TNCs based in both ASEAN and the rest of East Asia. The size of its population and its location between ASEAN and southern PRC are probably also factors. The activities of TNCs in Viet Nam are therefore closely related to firms in Asia and ASEAN in particular, and trends indicate that the country is strengthening its position as an investment recipient. The close upstream integration of activities indicate that Viet Nam does benefit from early development of countries in the region, where foreign subsidiaries are already in operation and where local economies are comparatively more developed.

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[8] Although part of these purchases in the local economy often take place among foreign subsidiaries, as opposed to purchase from locally owned firms.

Table 3. **Direction of Outputs/Exports and Direction of Inputs/Imports of Interviewed Firms (percentage share)**

	Direction of Interviewed Firms						
Survey Country	**Local**	**ASEAN**	**Japan**	**East Asia**	**Europe**	**North America**	**Rest of the World**
Total Outputs/Exports (100%)	28	7	13	8	20	22	4
Singapore	40	10	0	20	10	20	0
Malaysia	29	7	10	8	20	23	3
Thailand	26	13	14	8	14	23	2
Viet Nam	40	2	21	8	10	13	10
Cambodia	0	0	1	5	57	36	0
Total Inputs/Imports (100%)	26	13	15	29	7	7	3
Singapore	2	40	5	2	10	0	40
Malaysia	35	8	22	11	13	11	0
Thailand	35	1	18	25	3	16	2
Viet Nam	20	23	14	30	7	0	6
Cambodia	0	18	0	82	0	0	0

Notes: Export requirements are imposed by governments on 57 percent of companies, but this tends to reflect their intended output orientation in any case. Local content requirements are imposed by governments on 8 percent of companies.

Source: Mirza et al. (2003).

As a conclusion to this section, while global factors need to be taken into consideration, one should not underestimate the central role of geography in the determination of overall scale of FDI and dispersal of industries.[9] Investment location and strategies differ depending on the industry concerned, and as results from Mirza et al. (2003) have shown, subsidiaries have located in specific countries and regions, establishing themselves within a series of global and regional value chains. Viet Nam has substantially benefited from its position within ASEAN and Asia as a whole.

IV. DEEPENING VIET NAM'S INTEGRATION INTO TNC REGIONAL AND GLOBAL PRODUCTION NETWORKS

As the previous section shows, Asia and ASEAN account for a preponderant share of Viet Nam's international trade and inward investment, with over a third of recent FDI coming from East Asian economies (especially Hong Kong, China; Japan; Korea; and Taipei,China) and up to a quarter from ASEAN neighbors (chiefly Malaysia and Singapore). A considerable number of the operations established by companies based in ASEAN countries are "grandchildren" subsidiaries of TNCs whose ultimate headquarters are located elsewhere in the world. Thus, subsidiaries in Viet Nam are integrated into the global and regional value chains of firms, although, to date, most foreign subsidiaries continue to perform simple assembly-type manufacturing activities. That said, the above analysis of TNCs' global and regional activities suggests that further, potentially beneficial interrelationships across borders are eminently achievable. If Viet Nam is to further pursue this course of action, however, it needs to address a number of key issues: first, to what extent is Viet Nam able to continue to attract investment; second, how should such a strategy interface with that of its neighbors, especially in a regional context; and, finally, *should* it pursue this course (in other words how would increased FDI be beneficial to Viet Nam's economy)? These three questions are examined in Sections IV.A to IV.C below.

A. Viet Nam's Competitive Position in Attracting FDI

It might seem strange to query Viet Nam's attractiveness to TNCs, especially given the rapid rise and scale of inward FDI (Section III). However, bearing in mind that 40 percent of output by companies in Viet Nam is sold locally (Table 3), it is worth investigating the motivation of companies investing in the country and the consequent implications for competitive positioning. Table 4 suggests that, if we leave aside the broadly neutral reasons (e.g., political stability), then only 14 percent of the remaining reasons for investing in Viet Nam can be regarded as broadly "efficiency seeking" (i.e., using cheap local factors to service regional and global markets), whereas a full 45 percent of the reasons are "market seeking." The other motives are "mixed" and can be either efficiency or market seeking, depending on contingencies. By contrast, 30 percent of the non-neutral reasons for investing in Malaysia are efficiency seeking and 21 percent for Thailand (in fact 55 percent of the reasons for investing in Thailand are market seeking, but the country differs from Viet Nam in being relatively advanced, with a diversity of industries).

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[9] Jovanovic (2003) makes this point in his discussion of the significance of location, international/regional division of labor, and comparative advantage.

Table 4. **Reasons for Investing in Selected ASEAN Host Countries**

		Viet Nam		**Malaysia**		**Thailand**	
Type of Reason / Reason		**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Broadly Efficiency Seeking	International trading systems	1	1.6	2	3.0	1	1.5
	Low production costs	1	1.6	3	4.5	0	0.0
	Good infrastructure	0	0.0	5	7.5	0	0.0
	Regional dynamics/prospects	1	1.6	1	1.5	2	3.0
	Regional penetration (including intraregional relocation)	0	0.0	1	1.5	0	0.0
	Rationalization/reorganization policy	1	1.6	1	1.5	4	6.0
Mixed	Labor-related issues (cost, quality, capability development)	15	24.2	8	11.9	15	22.4
	Language ability	1	1.6	4	6.0	0	0.0
	Follow competitors	1	1.6	2	3.0	1	1.5
Broadly Market Seeking	Growth rates	0	0.0	0	0.0	0	0.0
	Size of the local market	9	14.5	6	9.0	3	4.5
	Sociocultural issues	0	0.0	0	0.0	3	4.5
	Gain local market share	1	1.6	1	1.5	1	1.5
	Follow customers	0	0.0	5	7.5	4	6.0
	Customer recommendation/decision	1	1.6	1	1.5	1	1.5
	Brand building	0	0.0	1	1.5	0	0.0
	Prior business contacts (OEM or other)	8	12.9	4	6.0	6	9.0
Broadly Neutral	Government incentives/policies	10	16.1	9	13.4	12	17.9
	Political stability	2	3.2	4	6.0	4	6.0
	Economic stability	2	3.2	5	7.5	4	6.0
	Other	6	9.7	3	4.5	4	6.0
	Total	62	100.0	67	100.0	67	100.0

Note: Multiple responses apply: each firm was asked to give up to three reasons for investing in the host country.
Source: Mirza et al. (2003).

The reason why the distinction between efficiency and marking seeking investments, albeit imperfect, is important is because there is ample evidence that efficiency seeking FDI is more likely to have a positive long-term impact on the host economy. For example, in a very large-scale recent study by the McKinsey Global Institute that surveyed four major developing countries (Brazil, PRC, India, and Mexico) and five important sectors (automotives, consumer electronics, food retail, retail banking, and information technology/business process offshoring), it was found that efficiency-seeking investment "overwhelmingly" had a positive impact on the host country (McKinsey Global Institute 2003). The impact of market seeking investments is more mixed. The econometric, macro part of the Bradford study found a strong link between FDI and growth in the older ASEAN member countries, as well as a strong, unambiguous, direct link between FDI and poverty reduction (Mirza et al. 2003, section 3). One of the reasons for this is the preponderance of efficiency-seeking investments in ASEAN countries such as Malaysia, Singapore, and Thailand.

The negative implications of market seeking investments in Viet Nam, especially because of its early stage of development, can also be underscored by examining the TNC subsidiaries interviewed in Viet Nam during the micro part of the study. Of the 22 firms in the sample; eight were in garments (an export-oriented industry, but prone to severe competition from many other developing countries); and eight in consumer electronics. All of the latter were oriented toward the limited[10] local market; all firms imported inputs that were further assembled or processed for domestic sale (the scale of the market was deemed too small to justify the production of local inputs); and most were worried about the quantity and quality of trained labor, especially management. On the positive side, a number were joint ventures with local companies, which encourages a degree of local learning. The Multilateral Investment Guarantee Agency came to similar conclusions about Viet Nam's consumer electronics industry, stressing that the supplier industry is underdeveloped, locally secured parts are of poor quality, and higher level managers and technicians are in short supply (MIGA 2003, 40-1). In other words, a million unit strong market for products such as TVs (unaffordable for most individual households) does not encourage significant investment; diversification of the industry; or other positive impacts on sector productivity, output, and employment. In fact, consumer electronics and similar fledgling industries in Viet Nam are threatened on a number of fronts: for example by both the scale economies of PRC-based industries and the increasingly innovation-led growth models being adopted by ASEAN neighbors such as Malaysia (MIGA 2003, Boston Consulting Group 2004).

Of course, the situation for Viet Nam is not unremittingly negative. Sample firms stressed the relatively high education levels and quality of Vietnamese workers and recognized how far they and the country had come in a short time (a little over a decade). One interviewee, who has 20 years experience in Asia, including in Cambodia, PRC, Philippines, and Viet Nam remarked that the quality and productivity awareness of Vietnamese workers is higher than any other developing Asian country, including People's Republic of China. Other firms interviewed in Viet Nam shared this view. Moreover, a country's competitive position is the result of a variety of factors, and with Viet Nam they are in its favor. Using an intensive range of measures, Kearney (2004) rated Viet Nam as 20th most attractive in its offshore location index, not a bad result, although key potential competitors for FDI fared better: India and the PRC at 1st and 2nd, respectively, in the survey; while ASEAN neighbors such as Malaysia, Philippines, Singapore, and Thailand are positioned, in order, 3rd, 5th, 6th, and 13th. Most importantly, the survey helps to identify key areas for improvement if Viet Nam is to enhance its competitive positioning vis-à-vis other countries. In the survey, although the country came 2nd in terms of "financial infrastructure" (compensation costs, infrastructure costs, tax, and regulatory environment), it scored 25th and 24th respectively in "people skills and availability" and "business environment." Essentially, Viet Nam has to put a lot of effort into improving capabilities and attributes such as developing a sizeable, quality labor force; business process experience and skills; government support for key industries; and security of intellectual property, especially if it intends to concentrate future efforts on encouraging inward efficiency-seeking foreign direct investment. Moreover, fortune may be smiling on Viet Nam. Given a likely upturn in FDI flows over the next few years (according to a recent survey, UNCTAD 2004), this could well be an opportune moment for Vietnam to pursue this new stage in its development. Certainly, as increasing numbers of low-income countries enter the world economy, economic development posited on cheap, low-skilled labor is no longer a viable option for Viet Nam.

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[10] That is, local incomes are very low.

B. Viet Nam and Regional Developments

Interestingly, while Viet Nam's small market size implies that the country should primarily focus on attracting efficiency-seeking FDI, the market toward which goods (industrial and consumer) are oriented *is* an issue. In the past, efficiency-seeking investments were frequently focused toward sales in industrialized international markets such as Europe, Japan, or North America, (indeed about 60 percent of output from firms in the Bradford sample go to these markets, as indicated in Table 3). However this is changing, partly because of the development of local or regional value chains (e.g., the hard disk industry in ASEAN; see McKendrick et al. 2000, Gourevitch and Bohn 2000), but more importantly because of TNC entry or expansion into other competitive *and* populous developing countries such as Brazil, PRC, India, and Mexico (McKinsey 2003). The Boston Consulting Group (2004, 16) reminds us, "...although the cost advantage remains the key driver of globalisation, in recent years it has been reinforced...by two other major factors. First [low-cost countries'] internal markets have matured into attractive, fast-growing markets, providing a powerful incentive for companies to invest locally. Second, capabilities in [low-cost countries] have greatly improved...."

Nowhere is this situation more evident than in the PRC (Boston Consulting Group 2003), a country on Viet Nam's doorstep, with which the country has to compete in terms of potential market and capabilities. In this respect, Viet Nam's position in ASEAN can be a major help, both in terms of market (the ASEAN Free Trade Area [AFTA]) and capabilities (the ASEAN Investment Area and consequent links into regional capabilities through TNC value chains).

In 2003 McKinsey conducted a major study of the competitiveness of Southeast Asian economies on behalf of ASEAN, a synopsis of which has appeared in the *McKinsey Quarterly* (Schwarz and Villinger 2004). McKinsey concluded, along with many other commentators, that Southeast Asia had a lot of factors going for it, including a population of 560 million people, vast natural resources, highly skilled workers, and export-oriented industries in medium- to high-technology sectors. However, the region continues to rely on the cost advantage it once enjoyed (but no longer does with respect to countries such as the PRC and India) without securing either or both of a *market access advantage* (i.e., TNCs keen to serve local markets; indeed intraregional trade as a share of total trade has fallen by 19 percent over the last decade; see Schwarz and Villinger 2004); or a recognized regionwide *capabilities advantage* to any degree (despite highly skilled workforces in Malaysia, Singapore, Thailand, and in pockets elsewhere in the region). The reasons for the former include subscale markets despite AFTA; unnecessary costs (especially different product standards across countries); and volatile rule implementation (the AFTA tariff rates are now very low, mostly between 0 and 5 percent, but these are not complied with by officials, because of ignorance, lack of training, or willfulness). ASEAN remains fragmented as a market.

In response to the study, in October 2003 ASEAN countries—including Viet Nam—endorsed an accord to create a single market (the ASEAN Economic Community [AEC]) by 2020, starting with a push in priority areas. The initial benefits of a fully implemented AFTA or AEC for Viet Nam are likely to be modest because of Viet Nam's small share of trade with ASEAN (Sakakibara and Yamakawa 2003a, 55), but these are likely to grow over time. In addition, Viet Nam is pursuing a number of other strategies to improve its market asset advantage, both in partnership with ASEAN and unilaterally. A number of free trade agreements (FTAs) are in the process of being negotiated by ASEAN with key neighbors, including PRC, India, and Japan. The ones with the PRC and Japan are most advanced. The most important is probably the ASEAN-PRC FTA, which secures "market advantage" access to the PRC's market for Viet Nam and its regional partners, and illustrates that relations between developing countries and regions need not be competitive. It is estimated that the ASEAN-PRC FTA will increase ASEAN's gross national product by 1 percent, and the PRC's by 0.3 percent, in the short term. In addition, Viet Nam is pursuing a number of bilateral deals, from the recently agreed FTA with Japan to more modest agreements with other countries, including the PRC and Korea (for further discussion on ASEAN and Viet Nam's regional agreements see Wee and Mirza 2004). Viet Nam is advantageously located geographically between the ASEAN bloc of countries (to the west) and other East Asian countries (to the east and north), most especially People's Republic of China. This may allow it to benefit as an intermediary, which it could exploit as the various FTAs come into force.

The ASEAN Investment Agreement (AIA), inaugurated in 1998, is an extension of AFTA and includes the specific intention of realizing regional integration by ASEAN and non-ASEAN TNCs through the utilization of the regional division of labor (Wee and Mirza 2004). ASEAN is one of the most diverse regions in the world in terms of resources and capabilities and a full implementation of the AIA, through the removal of intra-ASEAN barriers to investment, harmonization of investment policies, and national treatment of TNC subsidiaries, would go a long way toward Viet Nam increasing interconnection with various sources of advantage across Southeast Asia. However, as with trade, the region remains schizophrenic about investment cooperation, although a number of actions are under way or planned. These include consolidation and shortening of end dates (varying between 2003 and 2015) for various elements of the AIA; reconsideration of scheduled industries (those not subject to the AIA in various countries); identification and elimination of impediments to intra-ASEAN FDI; inclusion of services into the AIA; and recognition and support for nonequity forms of investment.[11] Past experience has shown that companies will deepen their regional integration based on fundamental economic factors (as evinced by the spillover of TNC operations from Singapore to Indonesia, Malaysia, Thailand, and more recently to the Philippines and Viet Nam, as discussed in Section III), whether governments pursue regional agreements or not. Indeed Viet Nam remains a likely place for companies based in ASEAN to invest: a third of all companies interviewed in the Bradford study said they were intending an investment or further investment in Viet Nam during the short term. However, a fuller realization of the AIA would certainly boost TNCs' ASEAN regional value chain activities and integrate countries further into a regional market and production base. Overall, it is in Viet Nam's interest to pursue ASEAN integration, both at the AFTA and AIA level, and thereby secure access to a wider regional market and regional division of labor/capabilities. In tandem with its ASEAN partners, this regional integration would allow Viet Nam to offset the actual or potential challenge posed by large developing countries such as Brazil, PRC, and India (Boston Consulting Group 2004), which simultaneously offer TNCs low labor costs; a large unified market; and a range of "capabilities" such as diverse labor skills, managerial capacity, productivity, and a degree of innovative abilities (all of these exist in ASEAN as a whole).

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[11] This is a partial list based on an internal ASEAN document, partly drafted by one of the co-authors.

C. Lessons from ASEAN

Finally, *should* Viet Nam pursue a course of deepening and extending its integration into TNC regional and global networks? In other words, how might increased FDI and TNC presence in the economy be beneficial to Viet Nam's development? It is possible to start to answer these questions by looking at the experience of other ASEAN countries, most particularly the exemplars Malaysia and Thailand (Section II), as gleaned from our survey of TNC investors in these countries. The Appendix Table summarizes the main findings in terms of direct, consumption multiplier, value chain multiplier, and spillover effects; and the issues and implications are discussed below. These results are based on firm knowledge and experience (as well as factual information, such as the scale of employment or input and output data) on how their activities affect the local economy (and not an inference from the statistical analysis of broad economic data). However, the number of firms in the sample is small (27, 25, and 22 subsidiaries in Malaysia, Thailand, and Viet Nam, respectively), so the findings should be treated as a guide, rather than being definitive.[12]

Turning to *direct effects* first, in any host country, FDI manifests itself in the form of a TNC establishing local operations, usually through one or more subsidiaries. These subsidiaries must set up shop by building a factory and related facilities, buy necessary equipment and supplies and, most importantly, hire workers who will frequently need to be trained. These interfaces between the subsidiary company and the economy are typical of the main direct effects that FDI has on the host country. The extent of these direct effects depends on:

(i) scale of the initial FDI;
(ii) technology employed;
(iii) numbers of people employed and the training and wages offered;
(iv) degree to which the firm can procure essential goods and services (e.g., machinery, construction engineers) locally; and
(v) proportion of profits reinvested periodically in the subsidiary (or other local expansion).

The Appendix Table shows that these effects have been high (employment, training, development of local capital) or middling (reinvestment). The nature of current subsidiaries in Viet Nam (few, small, market seeking, low-technology) means that the country is not able to potentially benefit from FDI to anywhere near the same degree as countries such as Malaysia or Thailand. This underscores the need to move toward efficiency-seeking FDI in the context of regional and global integration. Such a reorientation will also assist in upgrading human capital because the TNCS will be focused on the quality needs of more advanced markets, be these in ASEAN or further afield (and in both industrial and consumer goods). In addition Viet Nam can try and maximize net gains to FDI by using policies and measures refined by governments in ASEAN countries (e.g., the skill development fund in Malaysia; see Appendix Table).

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[12] Having said this, the surveyed firms include some of the largest subsidiaries in these countries, with extensive local involvement.

Second, since the subsidiary company is a constituent element of the TNC, it is a part of a value chain, both within the country and internationally. These links are both backward (with suppliers) and forward (with distributors and sales organizations). Inasmuch as these linkages stimulate activity, employment, etc. in supplier and distributor firms and organizations in the host country, then the initial FDI has a multiplier, i.e., amplified, effect beyond the initial direct effect on the local economy. This multiplier can be referred to as the *"value chain multiplier effect"* since it operates along the value chain (i.e., by increasing the output of suppliers and sales organizations), and its extent depends on similar factors to the direct effect. In particular, the multiplier will be affected by the degree to which the value chain linkages are within the host country or without: the greater the proportion of linkages with firms outside the host economy, i.e., in the regional or international domain, the lower will be the multiplier effect in the host.[13] In the case of both Malaysia and Thailand, the value chain multiplier is relatively low, for different reasons depending on the nature of the linkages. In terms of backward linkages, where the value chain multiplier effect is "low", the issues are (i) that inputs are imported from overseas because of a lack of local suppliers; and (ii) where local suppliers are used, these are themselves often the subsidiaries of foreign transnational corporations. With regard to forward linkages, other ASEAN countries tend to have a low value-chain multiplier because the output is exported; however, this is partly the consequence of efficiency-oriented investments (at least until a local market has developed to a sufficient level) and Viet Nam should not worry much about this, especially if it is trying to secure "market advantage" (Section IV.B) by deepening its linkages with ASEAN. Viet Nam has to develop a set of policies with respect to a local supply base, drawing on the experience, including failures, of its ASEAN neighbors. However, intensification of the AIA, matched by further TNC regional restructuring and integration of operations, implies a greater level of intra-industry trade. Not all inputs to subsidiaries in

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[13] Additionally, it is possible that some local linkages will be with the subsidiaries of other TNCs, diluting the multiplier effect because many such companies will also have some of their linkages abroad.

Viet Nam will be sourced in the country; and, by the same token, local-based firms will supply inputs to firms based in other ASEAN countries.

Third, in addition to the value chain multiplier, there is also the "standard" *consumption multiplier effect*: e.g., the subsidiary and its linked firms all pay taxes and their workers purchase goods and services (and pay taxes), all of which result in a boost to other sectors of the economy. In this respect, the FDI impact of the Malaysian and Thai economies has been high. The same could apply for Viet Nam, provided the country can attract efficiency-seeking subsidiaries in middle- and higher-technology industries (and thus higher remuneration, profits, and ultimately taxes). In order to do this, Viet Nam has to put a big emphasis on developing skills and capabilities (often in alliance with firms) in the domestic economy, as well as linking with regional capabilities through the regional division of labor. It can draw on policies pursued by both Malaysia and Thailand (because of their greater success), as well as other countries.

Fourth and finally, the subsidiary plays a role in transferring, encouraging, or obliging the transfer/take-up of knowledge, technology and skills—in a myriad of forms—to other organizations (especially indigenous firms) in the host country, principally through training, demonstration, and competitive effects. Collectively this is known as the *spillover effect* and can be the result of both deliberate (e.g., training of workers, quality control enforcement at suppliers, or student scholarships) and nondeliberate actions (e.g., competitive pressures on local firms or because the subsidiary can be seen as a "benchmark", model, or source of "best practices") (UNCTAD 2001 and 2003). In the longer run, this is the most important gain that an economy can receive from FDI because it means that indigenous concerns learn from foreign companies and are therefore in a position to redouble the development effort. From the evidence (Appendix Table), neither Malaysia nor Thailand has been very successful at reaping spillover gains. The greatest gain has come through the imparting of "world class" technology, knowledge, and expertise to some local suppliers, essentially because it is important to maintain quality and efficiency in a global supply chain. This underscores the necessity for Viet Nam to promote efficiency-seeking investment. One of the main reasons why few spillovers occur is either because of a dearth of local companies (certainly competitive ones in the manufacturing sector) or because they lack the capabilities to absorb foreign knowledge. In fact, Viet Nam has an established company base and some of these have set up joint ventures with TNCs (including in consumer electronics), which is a good start. However, as a whole, these companies have a long way to go before they are in a position to readily acquire and utilize technology from TNCs and other foreign sources. Viet Nam can again look to other ASEAN countries on best-practice lessons in order to do this. One policy it should certainly pursue (a relative failing in its exemplars, especially Thailand) is to encourage TNCs to train workers in scientific, engineering, and design skills, as well as production skills. Local companies can then acquire these workers through the labor market, and utilize them in order to absorb and exploit foreign technology.

Overall the findings of the Bradford study imply that Viet Nam can learn a lot of lessons from Malaysia, Thailand, and other ASEAN economies (summarized in the Appendix Table) in order to encourage further FDI and maximize the net gains. These lessons arise from both the examplars' successes and failures and can assist in devising pretty specific policies for FDI (and linked industrial policies), which could relate to issues such as which industries to support, orientation of subsidiaries, capability development policies (at various levels), infrastructural development, and regionalization strategies, such as the pursuit of free trade agreements. In addition, Viet Nam can look to advice in framing appropriate policies to a large research base and international institutions (including the Asian Development Bank, ASEAN Secretariat, and United Nations Council for Trade and Development).

V. CONCLUDING REMARKS

Since the early 1990s, Viet Nam has been pursuing the twin, interlinked goals of promoting regional development (in the context of ASEAN) and inward foreign direct investment. Using the results of a survey of TNCs with operations in ASEAN, as well as secondary sources, this paper set out to determine the extent to which Viet Nam has been successful in achieving these goals. Furthermore, the inquiry was extended to ask whether the country should deepen and widen its consequent involvement in Southeast Asia's TNC regional value chains. Section III examined the first of these questions in considerable detail and answered in the affirmative, showing that Viet Nam is now a major recipient of inward FDI, mostly linked to the value chain of TNCS, especially in electronics and garments. The regional aspect is especially manifest in consumer electronics, although most subsidiaries in Viet Nam still perform assembly-type operations and are local-market-oriented.

Section IV looked at the second issue and concluded that it was essential for Viet Nam to pursue its involvement in regional integration. One reason for this is that regional integration (both within ASEAN and in the broader East Asian context) helps to offset the competitive pressures of large developing countries such as the PRC and India which, in addition to Viet Nam's low labor costs, also have two other advantages: large (potential) markets and other capabilities, including skilled labor, a pool of good quality managers, and a degree of innovatory capacity. ASEAN, especially reinforced by a full-fledged development of AFTA and the AIA, would help Viet Nam offset this competition by providing a relatively large market in Southeast Asia and secure access to the pool of capabilities inherent in ASEAN's regional division of labor. This links in with a related issue, that is, most of Viet Nam's FDI in middle or "higher" technology FDI, e.g., consumer electronics, has tended to be in market-oriented operations. Unfortunately, investments oriented toward a small local market tend not to generate significant investment; diversification of the industry; or other positive impacts on sector productivity, output, and employment. This is in contrast to the high level of efficiency-seeking investments in other ASEAN countries, which has resulted in impressive gains from FDI, partly because TNCs aiming at global markets have to ensure that the quality and productivity of their operations (and their consequent links with local companies, including suppliers) have to be at an international level. This underscores the necessity for Viet Nam to pursue regional integration and further involvement in TNC value chains because, by doing so, it is helping to create the conditions under which TNCs are more likely to expand their investments in the country and pursue activities that will spill over as technology/knowledge transfer and other gains for the economy. As a corollary to this, Viet Nam has to, of course, expend considerable effort in improving domestic capabilities, including human resources and competence of suppliers, ideally in collaboration with TNCs and other organizations. Furthermore, in order to justify an emphasis on promoting additional inward FDI and determine appropriate policies, Viet Nam was compared with Malaysia and Thailand because the former is trying to pursue a similar path toward TNCs, growth, and development. Although not unqualified successes in terms of all the possible ways that FDI can impact on development, Malaysia and Thailand are good exemplars for Viet Nam (both because of failures and successes); and the analysis underlined the very careful and specific policies that Viet Nam can and should use to gain from the direct, value-chain multiplier, consumer multiplier, and spillover effects of foreign direct investment. This discussion also pointed toward the need for Viet Nam to increase its emphasis on efficiency-seeking FDI, e.g., because of the considerable transfer of knowledge along the supply chain from TNCs to suppliers in Malaysia and Thailand.

In conclusion, under the threat of international competition and in order to maximize the dynamic gains from FDI, the paper suggests that Viet Nam should reorient its policies regarding FDI, with increased emphasis toward targeting efficiency-seeking investments and development of more advanced links with TNC regional and global value chains. Moreover, the burgeoning imperative to provide "market advantage" and "capability advantage", along with "cost advantage" means that Viet Nam has to work with its ASEAN member countries to promote AFTA (providing access to a regional market) and the AIA (securing capabilities in Viet Nam and other ASEAN countries). Of course, Viet Nam (and ASEAN's) regional ambitions do not need to stop here and, in the context of forthcoming agreements with the PRC, India, Japan, and other neighbors, the possibilities are endless.

Appendix Table. **Lessons for Viet Nam based on a Summary of Malaysia and Thailand's Experience on FDI Effects on the Economy, Growth, and Poverty Reduction**

Type of FDI Effect		**Degree of Impact**	**Evidence of FDI Effect**	**Comments on Malaysian and Thai Experience**	**Implications for Viet Nam**
Direct Effects	Employment	High	The average number of employees per interviewed subsidiary in Malaysia and Thailand is 2,699 and 3,750 respectively. Women workers represent 48% of total in Malaysia and 71% in Thailand. Average annual output is US$1,504 million in Malaysia and US$327 million in Thailand. Two thirds of subsidiaries have sister companies in both countries.	A very high level of FDI in both countries means that manufacturing TNCs employ large numbers of people. Many subsidiaries are large, resulting in a big direct impact on the economy, growth, and poverty reduction. A very high proportion of workers are women and from poorer provinces.	The average number of employees in companies interviewed in Viet Nam is only 86, which pales against the scale in Malaysia and Thailand (60% of subsidiaries are small, average output is US$20 million). The difference arises from age of enterprise (most have been recently established); origin (ASEAN/East Asian investments can be small); and orientation (quite a few are aimed at the local market, which is small). Clearly there is a need to increase scale (although gigantism need not be the order of the day) by encouraging a wider range of industries and investors (by origin). Consideration needs to be given to issues related to location (i.e., how poorer provinces can benefit) and gender. Careful linking with ASEAN, East Asian, and global economies can maximize the net benefits of FDI.

Type of FDI Effect	Degree of Impact	Evidence of FDI Effect	Comments on Malaysian and Thai Experience	Implications for Viet Nam
Training, Human Capital	High	About 90% of the workforce in Malaysian and Thai subsidiaries have secondary schooling or higher. In Malaysia 1.9% of the payroll is spent on human resource development; in Thailand the figure is 2.7 percent. Workers in both countries receive more than 6 days training each a year, often in certifiable courses. Firms rated the current level of employee skills at an average of 3.7 out of a scale of 1 to 5 (unweighted) in Malaysia and 3.4 in Thailand. The average rose to 4.0 and 3.8 respectively for pure production-related skills (i.e., excluding innovation, soft skills etc.).	Relatively advanced segments of value chains transferred to both countries; quality of local products has to be high in order to meet expectations of international markets; many subsidiaries assigned strategic roles (e.g., related to R&D) or autonomous. High expenditures on HRD and many days devoted for training.	Viet Nam has a relatively highly educated population, so 78% of the workforce in interviewed firms has been educated to at least a secondary school level. However, there is still some way to go in terms of funds spent on skills development (only 1.5% of the payroll). A policy such as the skill development fund in Malaysia (where companies are taxed 1% of payroll, but which can be recouped when workers are trained) might be useful. Vietnamese workers are currently receiving appreciably more days of training (9) than their Malaysian or Thai counterparts, but this probably reflects the recent establishment of the Vietnamese subsidiaries. Overall, firms rate Vietnamese employee skills at 3.1 (3.4 for pure production), appreciably lower than Malaysia and Thailand, but higher than might be expected given the countries' level of development. Viet Nam can build strongly on these foundations.

Type of FDI Effect		Degree of Impact	Evidence of FDI Effect	Comments on Malaysian and Thai Experience	Implications for Viet Nam
	(Reinvestment)	Middling	Very few companies gave precise figures. The general investment was the reinvestment was occurring, but not at a rapid pace because of economic conditions.	TNCs, the primary source of future FDI expansion in these economies, need to be convinced to reinvest more.	Many companies based in other parts of ASEAN indicated an interest in investing in Viet Nam. This should certainly be encouraged because it will bring more jobs, a wider range of industries, and link Viet Nam more into the regional and global value chain. It is worth mentioning that most large and many medium TNCs from all over the world are already in ASEAN—and making profits—which can be usefully invested in Viet Nam and the region.
Consumption Multipliers	Consumption	High	Not directly measured, but implied by econometric study and the fact that average company size is large and wages quite high (because of past labor shortages).	A high rise in employment and wages has led to the growth of ancillary industries. Local conglomerates have grown on the back of this expansion.	Viet Nam should encourage local companies to take advantage of rising purchasing power, as in Malaysia and Thailand, ideally in manufacturing and not just retailing foreign-made goods.
	Taxes	High	As above. Income taxes are collected through companies, which means that the rate of collection is high. (Corporate taxes can be low, often because of privileges granted to exporters.)	Facilitated the improvement of social benefits, infrastructural development, education, training etc. (Note careful urban planning in Malaysia as opposed to Thailand.)	Careful infrastructural development and urban planning would be wise (avoiding white elephant schemes). Considerable attention has already been given to industrial zones. Care should be taken regarding export privileges extended to foreign TNCs. Opportunities exist for a variety of social, education, and other policies.

Type of FDI Effect		Degree of Impact	Evidence of FDI Effect	Comments on Malaysian and Thai Experience	Implications for Viet Nam
	Net Exports	High	Very high levels of exports—over 70% overseas. Although imports of inputs are also over 70%, the local value added (direct wages and salaries, local inputs) and large-scale production ensures that a high level of income stays in Malaysia and Thailand. Most foreign companies are export-oriented; few are oriented toward local markets.	Local companies have not always taken advantage of the opportunity to "seize" local markets before foreigners turn their attention inward, which is now happening. Export orientation as a mainstay for economic development is unsustainable in the long run; Malaysia and Thailand need to foster domestic-oriented development.	This is not yet an issue for Viet Nam and in the short run there is much to be gained from trade links with the rest of ASEAN and the PRC/East Asia.
Value Chain Multipliers	Suppliers	Middling	In Malaysia, 73% of inputs are bought from nonaffiliated companies, but only 41% of these are bought in the domestic market from *both* indigenous and foreign-originated companies. A similar situation prevails in Thailand, with 68% of inputs coming from nonaffiliated suppliers, 48% of which are bought from locally based suppliers.	The import of inputs from abroad and the existence of many local foreign-owned suppliers means that there is a mid-level effect on local suppliers, and hence their contribution (through wages, salaries, taxes to the multiplier effect). However, foreign-owned suppliers contribute to the value-chain multiplier too, so the main concern, in terms of the value chain multiplier, is the high level of imports.	The purchase of local inputs is lower in Viet Nam than Malaysia and Thailand. Only 50% of inputs are bought from nonaffiliated suppliers and, of these, about 32% are from locally based companies (indigenous and foreign). Viet Nam thus has to pursue the establishment of capable local suppliers; however, the import of inputs is not yet an issue because (i) local suppliers do not exist and (ii) inputs from ASEAN allow entry into regional/global value chains. A regional division of labor also implies a greater intra-industry trade.

Type of FDI Effect	Degree of Impact	Evidence of FDI Effect	Comments on Malaysian and Thai Experience	Implications for Viet Nam
Distributors and Sales Organizations	Low to Mid	Most companies in the sample are export-oriented and thus do not establish forward linkages in the domestic economy. The few that do are keen on ensuring high quality distribution, sales, and service.	"Indirect exports" (i.e., sales of components/inputs to companies in Malaysia or Thailand that export their output) means that forward linkages may be even lower than they appear. (Note: This paper focuses on companies manufacturing in ASEAN and so there is a sample bias: local market importers are largely excluded.)	Viet Nam is currently producing quite a few consumer products in local-foreign joint ventures. Greater attempts should be made to learn sales and marketing skills, rather than simply benefit from a share in high profit rates. A large population with rising incomes gives Viet Nam some leverage in this respect.
International links	High	The companies interviewed export over 70% of output in both Malaysia and Thailand, while about two thirds of inputs are imported. While exports and imports from/to Japan and North America are high for subsidiaries in both countries (US firms and trade figure more highly in Malaysia, while for Thailand it is Japanese), European firms (hence trade) are far more important for Malaysia and East Asian imports for Thailand. ASEAN trade is small: firms in Malaysia import 8% of inputs from ASEAN, while firms in Thailand export 11% of outputs to ASEAN.	This results in sizeable exports by value, but high international linkages are a source of concern when too large a share is imported. One key issue is to improve the local supplier base. There are considerable opportunities for regional value chains, especially taken up by ASEAN TNCs and consumer electronics firms (among others).	Still low linkages in terms of overall scale, but in directionality Viet Nam is similar to Thailand, though US links are largely absent and there is a large level of input import from ASEAN (23% of imports by interviewed companies). This represents an incipient regional value chain (especially with Singapore, Malaysia and Thailand), which can be developed. East Asia's share of input imports is 30%, which implies that the country could look to a wider East Asian regional grouping than ASEAN (perhaps ASEAN+3 makes more sense for Viet Nam and other ASEAN countries).

Type of FDI Effect		Degree of Impact	Evidence of FDI Effect	Comments on Malaysian and Thai Experience	Implications for Viet Nam
Spillover Effects (training, competitive effects, demonstration effects and human mobility)	Suppliers	Middling	Of those firms that buy inputs from local suppliers, only 7% buy high-tech goods from these companies, otherwise purchases are low-tech (42%) or secondary inputs (51%). Nevertheless, local suppliers are provided knowledge and support in terms of the goods they produce. Among interviewed firms in Malaysia, the likelihood of product specification transfer is very high at 4.64 (on a scale of 1 to 5) and the figure is similar in Thailand at 4.41. Transfer of other types of knowledge or support is somewhat lower (mostly between 2-3 depending on type for Malaysia and around 2 for Thailand). Foreign firms are somewhat more supportive of suppliers in Malaysia (52% have a supplier partnership scheme) than Thailand (32%). Overall there has been considerable improvement in the direct production-related skills of local suppliers (cost, quality, delivery), the degree of improvement being rated at an average of 3.6 (on a scale of 1 to 4) for Malaysian suppliers and 3.1 for Thai suppliers. Improvements in other types of skills (innovation, design, commercial skills etc.) were deemed somewhat lower, though the overall level was higher for local suppliers in Malaysia.	There is little room for spillovers in high-technology areas, but international supply chains mean that "world standard" technology, knowledge and expertise is imparted or seeps to suppliers. At present this largely relates to skills necessary for direct production (cost, quality, delivery, inventory control, lead-time performance), but these are a basis for moving up the value chain. There is a considerable need to support local suppliers, especially to allow them to compete in higher technology or value inputs, often against foreign suppliers based locally. Although some R&D is done locally, there is little opportunity for skills related to innovation, design etc. to seep to local suppliers and other firms. Policies to encourage this are necessary.	Vietnamese companies have to get to the first few rungs of (i) having sufficient foreign plants to supply and (ii) developing a wider supplier base. At present, to the extent it occurs, transfer of product specifications to local firms is only 3.1 (on a scale of 1 to 5) and between 1 and 2 in terms of other types of knowledge. There are no supplier partnership schemes (among the firms interviewed) but then there is the need for a critical mass of suppliers for such activities to occur. The firms interviewed rank the improvement in local suppliers at only 2.4 compared to 3.6 in Malaysia (but bear in mind that these are much younger relationships). Viet Nam clearly has to give priority to its supplier base, the quality of suppliers, and the relationships between suppliers and foreign subsidiaries.

Type of FDI Effect	Degree of Impact	Evidence of FDI Effect	Comments on Malaysian and Thai Experience	Implications for Viet Nam
Distributors and Sales Organizations	Low	As mentioned above, there are few forward links with local distributors etc. because of the export orientation of foreign firms.	As earlier. Sales subsidiaries importing consumption goods might be significant in spillover effects (but these are not part of this paper).	As earlier.
Competitors	Low to Mid	Very few companies interviewed had significant direct competition from local companies, although there were some examples in garments, consumer electronics, and electronic components. These included air conditioners, white and brown goods, and semiconductors.	A long way to go, but this paper has identified a number of mechanisms and routes being taken by exemplar local firms attempting to become significant players in their own right in Malaysia and Thailand. These include locally owned conglomerates that have entered new industries because foreign firms have established a market (demonstration effect, e.g., airconditioners, and consumer electronics); created local engineering and managerial expertise ("spin-off" or "silicon valley effects", e.g., semiconductor components manufacturers); or worked with foreign partners (joint ventures and similar, i.e., "learning by doing together").	As with suppliers, Viet Nam has to encourage the development of local companies that can take advantage of mechanisms such as the demonstration effect, spin-offs, and learning by doing. In this study there was one Vietnamese company making progress in improving its core products, technology, and expertise through effective joint ventures with a number of foreign partners. Many more such companies are needed.

Type of FDI Effect	Degree of Impact	Evidence of FDI Effect	Comments on Malaysian and Thai Experience	Implications for Viet Nam
Human Capital	Low to Mid	Considerable human capital of a high calibre has been generated by foreign companies in Malaysia and Thailand (see under "direct effects") above, but only a minimal level finds its way to locally owned suppliers, other manufacturers, spin-offs etc.	Policies to improve the use of skilled labor by local companies are essential. This might require some reorientation away from export-oriented development, toward local markets and needs. Foreign companies should be encouraged to create and impart scientific, engineering, and design skills as well as production skills. There is also the issue of the "loss" of skilled women workers back to provinces and other occupations.	As earlier under training.

Note: The summary data are drawn from 27 Malaysian, 25 Thai, and 22 Vietnamese subsidiary companies in the sample.
Source: Mirza et al. (2003).

REFERENCES

ADB, 2003. *Key Indicators 2003.* Asian Development Bank, Manila, Philippines.

———, 2004. *Asian Development Outlook 2004.* Hong Kong, China: Oxford University Press for the Asian Development Bank.

Airriess, C. A., 2001. "Regional Production, Information-communication Technology, and the Developmental State: The Rise of Singapore as a Global Container Hub." *Geoforum* 32(2):235-54.

A. T. Kearney, 2004. *Making Offshore Decisions.* Chicago: A.T. Kearney.

Borrus, M., D. Ernst, and S. Haggard, 2000. *International Production Networks in Asia: Rivalry or Riches?* London, New York: Routledge.

Boston Consulting Group, 2003. *China: The Pursuit of Competitive Advantage and Profitable Growth.* Boston Consulting Group, Boston.

———, 2004. *Capturing Global Advantage.* Boston Consulting Group, Boston.

Cooper, M., 2002. "Viet Nam: Is Doi Moi the Way Forward in Post-crisis Asia?" In U. C. V. Haley and F. J. Richter, eds., *Asian Post-Crisis Management: Corporate and Governmental Strategies for Sustainable Competitive Advantage.* London: Palgrave Macmillan.

Dicken, P., 2003, *Global Shift: Reshaping the Global Economic Map in the 21st Century,* 4th ed. London: Thousand Oaks and New Delhi: Sage Publications.

Dicken, P., and A. Malmberg, 2001 "Firms in Territories: A Relational Perspective." *Economic Geography* 77:345-63.

Dobson, W., and S. Y. Chia, eds., 1997. *Multinationals and East Asian Integration.* Institute of Southeast Asian Studies, Singapore.

Gates, C. L., 2000. "Viet Nam's Economic Transformation and Convergence with the Dynamic ASEAN Economies." *Comparative Economic Studies* 42(4).

Giroud, A., 2003. *Transnational Corporations, Technology and Economic Development.* Cheltenham: Edward Elgar.

———, 2004. "FDI and the Rise of Cross-Border Production Networks in Southeast Asia." In N. Freeman and F. Bartels, eds., *The Future of Foreign Investment in Southeast Asia.* London: Routledge.

Gourevitch, P., R. Bohn, et al., 2000. "Globalization of Production: Insights from the Hard Disk Drive Industry." *World Development* 28(2).

Hill, H., 2000. "Export Success Against the Odds: A Vietnamese Case Study." *World Development* 28(2).

Ito, T., and A. O. Krueger, 2000. *The Role of Foreign Direct Investment in East Asian Economic Development.* Chicago: The University of Chicago Press.

Japan Research Institute Limited, 2001. "Automobile Manufacturers Unveil New ASEAN Strategies." *Asia Monthly* October 1(7):1-2.

Jovanovic, M. N., 2003. "Local vs. Global Location of Firms and Industries." *Journal of Economic Integration* 18(1).

Krumm, K., and H. Kharas, eds., 2003. *East Asia Integrates: A Trade Policy Agenda for Shared Growth.* World Bank, Washington D.C.

Legewie, J., and H. Meyer-Ohle, 2000. *Corporate Strategies for Southeast Asia After the Crisis.* London: Palgrave MacMillan.

McKendrick, D., R. F. Doner, et al., 2000. *From Silicon Valley to Singapore: Location and Comparitive Advantage in the Hard Disk Drive Industry.* Stanford: Stanford University Press.

McKinsey Global Institute, 2003. *New Horizons: Multinational Company Investment in Developing Economies.* San Francisco: McKinsey and Company.

Multilateral Investment Guaranty Agency (MIGA), 2003. *Snapshot Asia: Benchmarking FDI Competitiveness in Asia.* World Bank Group, Washington, D.C.

Mirza, H., A. Giroud, H. Jalilian, J. Weiss, N. Freeman, and M. Than, 2003. *Regionalisation, Foreign Direct Investment and Poverty Reduction: The Case of ASEAN.* University of Bradford, United Kingdom.

Richter, F.-J., 1999. *Business Networks in Asia: Promises, Doubts, and Perspectives.* Westport: Quorum.

Sakakibara, E., and S. Yamakawa, 2003a. *Regional Integration in East Asia: Challenges and Opportunities. Part One: History and Institutions.* World Bank, Washington, D.C.

———, 2003b. *Regional Integration in East Asia: Challenges and Opportunities. Part Two: Trade, Finance and Integration.* World Bank, Washington, D.C.

Schwarz, A., and R. Villinger, 2004. "Integrating Southeast Asia's Economies." *The McKinsey Quarterly* 1.

Song, J., 2002. "Firm Capabilities and Technology Ladders: Sequential Foreign Direct Investments of Japanese Electronics Firms in East Asia." *Strategic Management Journal* 23.

Sturgeon, T. J., 2002. "Modular Production Networks: A New American Model of Industrial Organization." *Industrial and Corporate Change* 11(3):451-96.

UNCTAD, 1993. *World Investment Report 1993: Transnational Corporations and Integrated International Production.* New York and Geneva: United Nations.

———, 1999. *World Investment Report 1999: Foreign Direct Investment and the Challenge of Development.* New York and Geneva: United Nations.

———, 2001. *World Investment Report 2001: Promoting Linkages.* New York and Geneva: United Nations.

———, 2003. *World Investment Report 2003: FDI Policies for Development. National and International Perspectives.* New York and Geneva: United Nations,

———, 2004. *Prospects for FDI Flows, TNC Strategies and Policy Developments, 2004-2007.* New York and Geneva: United Nations.

Wee, K. H., and H. Mirza, 2004. "ASEAN Investment Cooperation: Retrospect, Developments and Prospects." In N. Freeman and F. Bartels, eds., *The Future of Foreign Investment in Southeast Asia.* London: Routledge.

Wong, P.-K., 1997. "Creation of a Regional Hub for Flexible Production: The Case of the Hard Disk Drive Industry in Singapore." *Industry and Innovation* 4(2):183-206.

Aggregate Investment in People's Republic of China: Some Empirical Evidence

XINHUA HE AND DUO QIN

Aggregate domestic investment in People's Republic of China is empirically modeled using quarterly data for the period 1994-2001. The total investment is disaggregated into two parts: business sector investment and government direct investment. The dynamic specification approach is adopted and the equilibrium-correction model form is used. Business sector investment is found to follow closely the standard capital input demand theory in the long run, but to respond positively to changes in government direct investment in the short run. It is found that government investment is driven, additionally to the revenue constraint, by the policy targets of maintaining steady economic growth and reducing unemployment. The resulting investment equations provide a sound model base for policy simulation and forecasting.

I. INTRODUCTION

Capital investment holds a key role in the economic growth and performance of the People's Republic of China (PRC). During the last two decades, fixed capital formation has taken up roughly one third of gross domestic product (GDP) and kept a double digit growth on average, albeit with remarkably volatile dynamics (5.5 percent growth in 1981, nearly 40 percent in 1985, –7 percent in 1989, over 60 percent in 1993, down to 5 percent in 1999, and well above 20 percent in 2003). Fixed capital investment was dominantly driven by government plans under the old centrally planned economic regime. What drives the fast-growing and volatile aggregate investment now that the PRC economy has become increasingly market-driven after over two decades of reforms? How much, in particular, is aggregate investment driven by market forces and how much is still affected by policy-led factors?

The present study attempts to answer these questions by econometric modeling. The data sample is quarterly for the period 1994Q1-2001Q4. According

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to the *Statistics Yearbooks of China* (SYC), the total investment is composed of two parts: domestic investment and foreign direct investment. The latter contributes to less than 10 percent of the total investment on average, despite its rapid increase since 1990.[1] Here, only the domestic investment part will be modeled.

As government policies still exert important impact on the dynamics of the aggregate investment (e.g., see Yu 2004), domestic investment is further disaggregated into two parts with respect to data availability: government direct investment and business sector investment. The latter covers state-owned enterprises (SOEs), collective-owned enterprises (COEs), and private enterprises (PEs). Around 90 percent of the total domestic investment has been made up of SOEs and COEs over the last two decades. Here, the SOEs are grouped together with COEs and PEs partly because of data constraints and partly because their business behavior has become largely market-oriented similar to other firms of different ownership since the early 1990s.

Investment behavior of SOEs has changed substantially over different stages of the economic reform. Briefly, when the PRC's economic reform started in 1978, SOEs were totally planned and controlled by the government in terms of their factor inputs and product outputs. The banking sector was directly accountable to government plans and had no autonomous dealings with SOEs' investment projects (see discussion in Shang 2000). Reforms of SOEs have been gradual and can roughly be divided into three phases (see Xiang 1999, Cong 2002). The first phase covers 1978-1986. Reforms during this period were carried out in several key aspects:

(i) delegating more decision-making power and economic responsibility to SOEs' managers;
(ii) allowing SOEs to retain part of their profits;
(iii) replacing the system of profit submission with that of tax payment; and
(iv) switching gradually from the system of government direct financing to that of bank lending.

The second phase covers the period 1987-1993, when SOEs' profits were in decline due to increasing competition from the rising non-SOE sectors. The key reform of this period was the implementation of the contract system, which was intended legally to clarify the separate rights and responsibilities between the state and the managers of state-owned enterprises. In practice, however, the contract system deferred SOE reforms, as many SOEs managed, in their contracts, to minimize the amount of profits to be submitted to the state and to maximize the part of their budget from the state plans.[2] The third phase is marked by a clear division between the ownership and the management of SOEs, initiated by enterprise tax reforms and by the founding of the China Development Bank in 1994. Since then, SOEs have been subject to a unified taxation system, which is applicable to all other types of domestic enterprises. State ownership has been explicitly embodied in the submission of a certain proportion of profits to the state. The SOEs have been allowed to lay off excess employees and their fixed investment has been completely severed from government fiscal financing.[3] To make bank lending activities more independent from state interventions, both the law of People's Bank of China (the central bank) and the law of commercial banks in the PRC were issued in 1995.[4] In light of the significant changes outlined above, it is reasonable to examine the investment behavior of various types of PRC enterprises in aggregate for the sample period.

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[1] Foreign direct investment slightly exceeded 10 percent around the mid-1990s, as shown in *Statistics Yearbook of China*.

Several empirical models of the PRC's aggregate investment can be found in the recent literature (e.g., see Sun 1998, Zhu and Liang 1999, Shen et al. 1999, Shen 2000, Song et al. 2001, Qin and Song 2003). Sun (1998) models the total fixed real investment by the state sector from the supply side perspective. He finds real investment forming a relatively constant, long-run cointegrated relation with per capita grain output and per capita energy consumption using annual data for 1953-1995. Zhu and Liang (1999) model domestic fixed capital investment as a function of the amount of total bank loans, government investment, enterprise profit, depreciation rate and real interest rate. Their approach was based on the argument that domestic investment mainly reflects government behavior because the investment of SOEs makes up of two thirds of the domestic investment. Zhu and Liang estimate a model using annual data of 1978-1997. Similarly, the models built by Shen et al. (1999) and Shen (2000) explain domestic fixed capital investment by government investment plans, total bank loans, and foreign direct investment and are estimated with annual data for 1979-1996. Conversely, Song et al. (2001) maintain that the PRC's investment system has changed fundamentally since the reforms, and model the total investment by the standard factor-input demand approach. Song et al. adopt equilibrium correction models (ECM) as their econometric model form and estimate the model with panel data of 28 provinces for 1983-1995. They find the total investment cointegrating with GDP and the user cost of capital in the long run, but the equilibrium-correcting force is weak (i.e., the correcting coefficient is small). Qin and Song (2003) focus their attention on measuring investment efficiency using provincial panel data for 1989-2000. They also follow the factor-input demand approach and verify the existence of a long-run relation between investment and GDP. However, investment is found barely to respond to capital pricing signals in their model.

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[2] Government plans still dominated the allocation of commercial bank loans before 1995 (see, for example, Shang 2000, 120-4).

[3] Price reforms preceded enterprise reforms in the PRC. Shortly before the third stage, prices of the most commodities and services had been freed from state control (see Wang 2002, 94-8).

[4] The major source of external funding for SOEs is bank loans. Direct public borrowing via securities markets is still in its infant stage, as the two PRC stock markets (Shenzhen and Shanghai) only started to operate in 1992, and the number of firms listed has been very small.

The present study aims at finding an empirical model of aggregate investment, which would be useful for policy simulation and forecasting.[5] Policy simulation and forecasting requires the model to be both structurally meaningful and time-invariant. The paper decomposes the changes of investment into dynamic responses to various shocks in the ECM form to ensure their meaningful interpretation. Recursive estimation checks for coefficient invariance. As mentioned earlier, behavioral equations are formulated separately for business sector investment and government direct investment. This not only facilitates further policy analysis but also enables examination of both demand side and supply side factors.

The rest of the paper is organized into three sections: Section II discusses the theoretical investment models to be used in econometric modeling; Section III reports and discusses the empirical results; and Section IV highlights the main conclusions.

II. THEORETICAL MODEL

Aggregate investment dynamics pose a key challenge for macro modelers (see Caballero 1999). There are two main approaches to this challenge. One is to elaborate, on the basis of a priori rational expectations and other microeconomic arguments, traditionally developed static investment models into dynamic and stochastic models by the Euler equation method. Unfortunately, empirical estimation results of such models have so far been unsatisfactory (see Oliner et al. 1995). The other approach is to regard traditionally developed static models as the essential, long-run equilibrating force embedded in dynamic models, which are identified via *a posteriori* econometric means; see Hendry (1995). The latter approach is adopted.

The task of this section is to postulate meaningful long-run equilibrium relations for the PRC's aggregate investment. As described in Section I, domestic investment, I, is disaggregated into government direct investment, I_G, and business sector investment, I_B:

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[5] In fact, the model reported here forms part of a quarterly macro model of the PRC, which has been set up by the Institute of World Economics and Politics of the Chinese Academy of Social Sciences, jointly with Duo Qin for the Asian Development Bank.

$$I = I_G + I_B \tag{1}$$

Since the data set starts from 1994, when the market economy already prevailed in most business activities, it is appropriate to describe the business sector investment principally by the orthodox factor-input demand model, as Song et al. (2001) and Qin and Song (2003) have done.[6] As for government direct investment, its determinants are chosen from a mixture of essential policy targets and supply side constraints.

A. Business Sector Investment

Assume that the PRC business sector chooses its long-run desired capital, K_B^*, by optimizing its factor input subject to a constant returns to scale, Cobb-Douglas production technology.[7] The optimization problem leads to the following standard first-order condition:

$$K_B^* = \gamma \frac{Y}{c} \tag{2}$$

where γ is the elasticity of output, Y, with respect to capital, and c is the user cost of capital. For the latter variable, we follow the principle of Romer's definition (2001):

$$c = \frac{P_k}{P} \frac{(r + \delta - \pi)}{(1 - \tau)} \tag{3}$$

where P_k is the price of capital goods, P is output price, r is the nominal interest rate, δ is the rate of economic depreciation, π is the inflation rate defined by P_k, and τ is a composite tax rate (see the Appendix for a detailed definition of this variable).

Next, we follow the convention to define the desired investment, I_B^*, as keeping capital at its desired level over time:

$$I_{Bt}^* = (K_t^* - K_{t-1}^*) + \delta K_{t-1}^* \tag{4}$$

---

[6] Notice that Qin and Song (2003) have tried supply-side factors such as firms' debt and bank loans but find them insignificant.

[7] Note that output and factor prices are taken as given or unaffected by investment decisions in neoclassical theory (see Caballero 1999 and Romer 2001). As the present model of investment forms only part of a macro model, the issue of how investment interacts with output and prices is beyond the current discussion and should be tackled within the macro model.

Subtracting I^*_{Bt-1} from both sides of (4) and combining with (2), we get:

$$\Delta I^*_{Bt} = \gamma\Delta\left(\frac{Y}{c}\right)_t - \left[I^*_B - \gamma\delta\left(\frac{Y}{c}\right)\right]_{t-1} \tag{5}$$

As (5) resembles an ECM, we can regard the term in the squared brackets on the right hand as implying the long-run equilibrium relation: $I^*_B = \gamma\delta\frac{Y}{c}$. Considering the possibility that the PRC business sector investment may also be affected by the government investment policies, we extend that equilibrium relation by adding government direct investment as a new explanatory variable. Thus we have, in logarithm:

$$\ln I^*_B = \alpha_0 + \alpha_1 \ln Y + \alpha_2 \ln c + \alpha_3 \ln I^*_G \tag{6}$$

where $\alpha_0 = \ln \gamma\delta$. We expect that $\alpha_1 = 1$ and $\alpha_2 = -1$.[8]

B. Government Direct Investment

Unlike business investment, there are no well-established theoretical models for government direct investment. In view of the PRC's current situation, government investment can be seen to play mainly two roles (see, for example, Xiang 1999): first, the government is responsible for financing state-prioritized investment projects; second, government budgetary investment is still used as a major fiscal policy tool. Obviously, investment of the first type is planned within the state revenue, whereas investment of the second type is designed to serve key economic targets. Hence, it can be postulated that government direct investment is partly determined by government revenue and partly by two important economic targets: (i) stimulating economic development and stabilizing its growth rate, and (ii) reducing unemployment. Specifically, the following is the proposed long-run relation for the desired government direct investment I^*_G:

$$\ln I^*_G = \beta_0 + \beta_1 \ln G_R + \beta_2 \ln(Y/Y^T) + \beta_3 u \tag{7}$$

where $u = \frac{L_s - L}{L_s} \times 100\%$ denotes the unemployment rate, L_s is the economically active population or labour force and L employment, G_R is government revenue, and Y^T denotes the long-run production trend in Y. By economic reasoning, it can be expected that $\beta_1 > 0$, $\beta_2 < 0$, and $\beta_3 > 0$.

---

[8] Notice that this equation allows for a more general assumption than the constant return to scale assumption, i.e., $\alpha_1 > 0$. This also applied to the cost of capital elasticity, $\alpha_2 < 0$. In fact, the latter parameter is relaxed from unity in Caballero (1999).

As Y^T is unobservable, various methods have been proposed to measure it. Essentially, these methods differ in the smooth algorithm used to filter out the trend component from the actual output time series. The choice of algorithm is normally made either by economic criteria or time-series criteria. Here, we take both into consideration. In view of economics criteria, we propose to define Y^T by the symbolically market-driven Cobb-Douglas production function, with constant of returns to scale to reflect the long-run prospect:

$$\begin{aligned} Y^T &= AK^{\theta}L^{1-\theta} \\ \ln Y^T &= \ln A + \theta \ln K + (1-\theta)\ln L \end{aligned} \tag{8}$$

In view of time series criteria, the coefficients in (8) can be estimated by its long-run equilibrium solution (see the next section).

III. EMPIRICAL RESULTS

A. Econometric Issues

The study sample contains quarterly data of 1994Q1-2001Q4. Detailed definitions of variables and data sources are reported in the Appendix. Figure 1 plots the data series of main variables. It is obvious that some series contain strong seasonal patterns. This is mainly due to the current data collecting procedures of the National Bureau of Statistics (NBS).[9] Quarterly dummies filter out regular seasonal patterns. However, part of the seasonality in the investment series may have resulted from the convention of government investment plans. According to Shang (2000, 394), the People's Bank of China employed the strategy of "tightening in the first half of a year and expanding in the second half" in its relending operations during 1988-1991. It can be expected that significant effects from such strategies should be picked up by relevant short-run policy variables.

Equations (6) and (7) form the basis of the present study's econometric work. To enable estimation, we rewrite them as:

$$\ln I_{Bt} = \alpha_0 + \alpha_1 \ln Y_t + \alpha_2 \ln c_t + \alpha_3 \ln I_{Gt} + E_{Bt} \tag{6'}$$

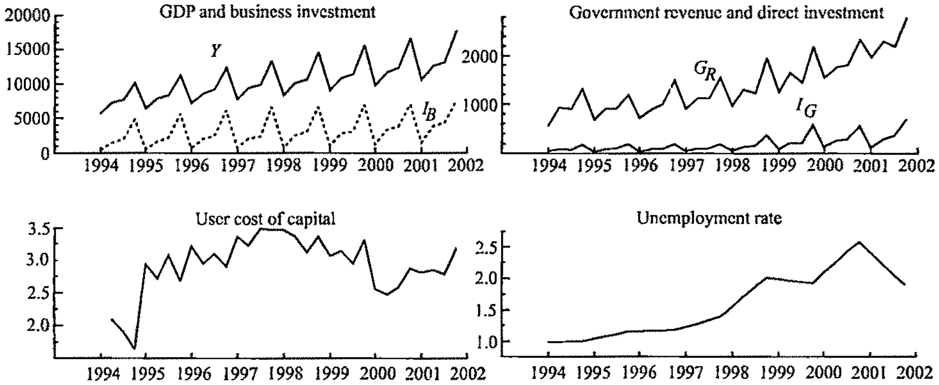
$$\ln I_{Gt} = \beta_0 + \beta_1 \ln G_{Rt} + \beta_2 \ln(Y/Y^T)_t + \beta_3 u_t + E_{Gt} \tag{7'}$$

---

[9] The NBS began reporting quarterly national account statistics in 1992. However, calculation of the quarterly statistics is still relied heavily on the annual national account process. In fact, the quarterly statistics are only collected during the first three quarters, with the fourth quarter being left as the gap between the annual accounting results and the first three quarter results.

where E_{Bt} and E_{Gt} denote disequilibrium errors and are expected to be weakly stationary.

Figure 1. **Data Series of Main Variables**



Note: GDP, business investment, government revenue, and government direct investment are in 100 million *yuan*; user cost of capital and unemployment rate is in percentage points.

It is well known that direct regression of (6') and (7') may risk nonsense inference if some of the variables are nonstationary. From experience, variables such as investment, output, and income in (6') and (7') tend to exhibit nonstationary properties. A common solution under such circumstances is to employ cointegration analysis based on a general Vector AutoRegression (VAR) specification of (6') and (7'). However, two factors render this strategy unworkable here. The key factor is the limited sample size (32 observations). Another factor is that all the variables in a cointegration vector are required to be of the same degree of nonstationarity, whereas some of the variables in (7'), such as $\ln(Y/Y^T)$, are unlikely to be nonstationary. In fact, it is difficult to distinguish from the limited sample data whether the variables are nonstationary or trended stationary, as shown in Figure 1. To circumvent these problems, a single-equation, dynamic specification approach is adopted. Starting with an auto-regressive distributed-lag (ADL) model of (6') and (7') respectively, gradually reduce the model, and reparameterize it into a parsimonious, data-congruent, and economically interpretable ECM, which has the general form:[10]

---

[10] For the detailed econometric procedure see Hendry (1995). The software PcGive 10.0 is used in the model reduction and estimation (see Hendry and Doornik 2001).

$$\begin{aligned}\Delta \ln I_{Bt} &= a_0 + \sum_{i=1}^{d} a_{0i} \Delta \ln I_{Bt-i} + \sum_{j=0}^{d} a_{1j} \Delta \ln Y_{t-j} + \sum_{j=0}^{d} a_{2j} \Delta \ln c_{t-j} \\ &\quad + \sum_{j=0}^{d} a_{3j} \Delta \ln I_{Gt-j} + \lambda_B E_{Bt-1} + \varepsilon_{Bt}\end{aligned} \tag*{(9)}$$

$$\begin{aligned}\Delta \ln I_{Gt} &= b_0 + \sum_{i=1}^{d} b_{0i} \Delta \ln I_{Gt-i} + \sum_{j=0}^{d} b_{1j} \Delta \ln G_{Rt-j} + \sum_{j=0}^{d} b_{2j} \Delta u_{t-j} \\ &\quad + \sum_{j=0}^{d} b_{3j} \ln(Y / Y^T)_{t-j} + \lambda_G E_{Gt-1} + \varepsilon_{Gt}\end{aligned} \tag*{10)}$$

where Δ denotes first difference, d is the minimum lag determined in such a way that the white-noise properties of residuals ε_{Bt} and ε_{Gt} are ensured. It is expected that $-1 \leq \lambda_B < 0$ and $-1 \leq \lambda_G < 0$ for the long-run equilibrium correction mechanism (6') and (7') to be at work. Notice that the long-run, equilibrium relation embedded in (10) differs from (7') in that the target variable, $\ln(Y/Y^T)$, is excluded. This is due to the expected stationarity of this variable and should not affect the economic meaning of (7).

One of the advantages of the ECM is its flexible capacity in dealing with nonstationarity. By taking differences, it generally removes any nonstationarity from its regressant and regressors. Moreover, it does not entail that all the variables within an equilibrium-correcting term should be nonstationary to the same degree. All it requires is stationarity of the equilibrium-correcting term, e.g., E_{Bt-1} in (9) or E_{Gt-1} in (10). This single-equation approach is susceptible to problems of simultaneity and related exogeneity. Two strategies are adopted to tackle these problems. One strategy, if simultaneity turns out to be present after reducing the models into parsimoniously ECMs by single-equation ordinary least square (OLS) methods, is to reestimate these ECMs by instrumental variable (IV) methods. The second strategy is to employ the recursive estimation method extensively as the means to check for exogeneity.[11]

B. The Business Sector Investment Model

Starting from a four-lag ADL form of (6'), together with constant and seasonal dummies, the following parsimonious ECM is obtained through model reduction:

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[11] For the definition of various types of exogeneity, see Engle et al. (1983). For detailed discussion on handling exogeneity in single-equation empirical studies, see Qin (2003).

$$
\begin{aligned}
\Delta \ln \hat{I}_{Bt} &= \begin{array}{c} 0.005433 \\ {\scriptstyle (0.0347)} \\ -0.00012 \\ {\scriptstyle (0.0371)} \end{array} - \begin{array}{c} 0.2788 \\ {\scriptstyle (0.0864)} \\ 0.3174 \\ {\scriptstyle (0.1252)} \end{array} \Delta_3 \ln c_t - \begin{array}{c} 0.922 \\ {\scriptstyle (0.0174)} \\ 0.9197 \\ {\scriptstyle (0.0183)} \end{array} \Delta_3 \ln I_{Bt-1} - \begin{array}{c} 0.3259 \\ {\scriptstyle (0.0848)} \\ 0.3446 \\ {\scriptstyle (0.0958)} \end{array} E_{Bt-1} \\
&\quad + \begin{array}{c} 0.1345 \\ {\scriptstyle (0.0515)} \\ 0.1443 \\ {\scriptstyle (0.0566)} \end{array} \Delta \ln I_{Gt-1} + \begin{array}{c} 0.2272 \\ {\scriptstyle (0.104)} \\ 0.2425 \\ {\scriptstyle (0.1102)} \end{array} \Delta \ln Y_{t-2} \qquad (9') \\
E_{Bt} &= \ln I_{Bt} - \ln Y_t + \ln c_t
\end{aligned}
$$

where Δ_3 denotes difference of three period, e.g. $\Delta_3 \ln c_t = \ln c_t - \ln c_{t-3}$, and

$$
c_t = \frac{P_{k,t}}{P_t} \frac{(r_t / 4 - \frac{P_{k,t} - P_{k,t-1}}{P_{k,t-1}} * 100 + \delta_t / 4)}{1 - \tau_t / 100}
$$

as defined in equation (3). Coefficients in the upper row are OLS estimates and those in the lower row are IV estimates to check for the possible simultaneous effect of $\Delta_3 \ln c_t$.[12] The two sets of estimates show little statistical difference, ruling out significant simultaneous-equations bias. Standard errors of the coefficient estimates are given in brackets below the estimates. Unit-root test results of all the variables are reported in Table 1. Actual and fitted values of $\Delta \ln I_{Bt}$ by the OLS, as well as the residuals are plotted in Figure 2. Diagnostic tests on model (9') are reported in Table 2. Figure 3 shows recursive OLS coefficient estimates of all the explanatory variables and various types of Chow tests based on the recursive estimation.

Table 1. **Augmented Dickey-Fuller (ADF) Unit-root Test (sample period 1994Q1-2001Q4)**

Variable	$\Delta \ln I_{Bt}$	$\Delta \ln Y_t$	$\Delta \ln I_{Gt}$	$\Delta_3 \ln I_{Bt}$	$\Delta_3 \ln c_t$	E_{Bt}	E_t^T	E_{Gt}
t-ADF	-4.906	-6.899	-4.312	-4.379	-3.751	-5.054	-4.928	-5.151
5% Critical Value	-2.96	-2.96	-2.96	-2.96	-2.97	-2.96	-2.96	-2.96

Notes: All used one lag except $\Delta_3 \ln c_t$ used no lag. Trend and seasonal dummies are used for $\Delta \ln I_t$, $\Delta \ln Y_t$, $\Delta \ln I_{Gt}$, and $\Delta_3 \ln I_t$.

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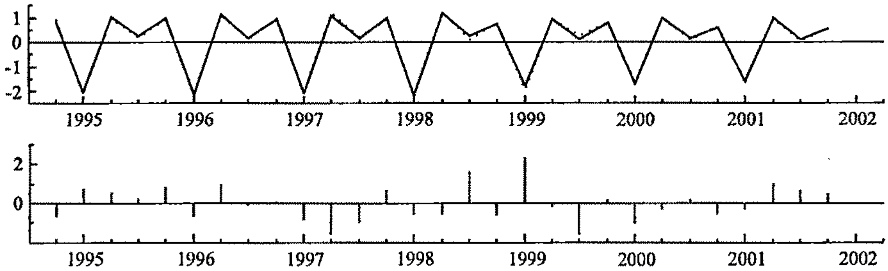
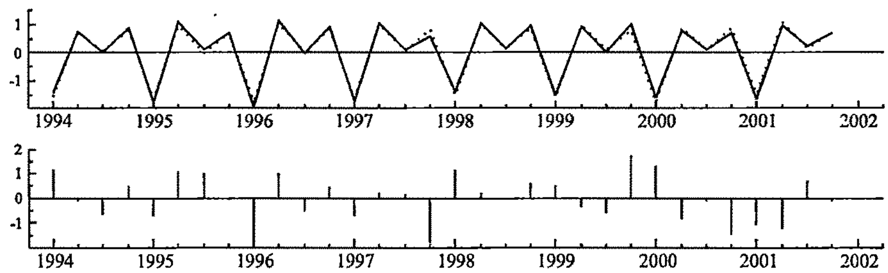
[12] Its own lags are used as the instrument variables.

Figure 2. **Business Investment and Government Direct Investment in People's Republic of China**

Business Investment



Government Direct Investment



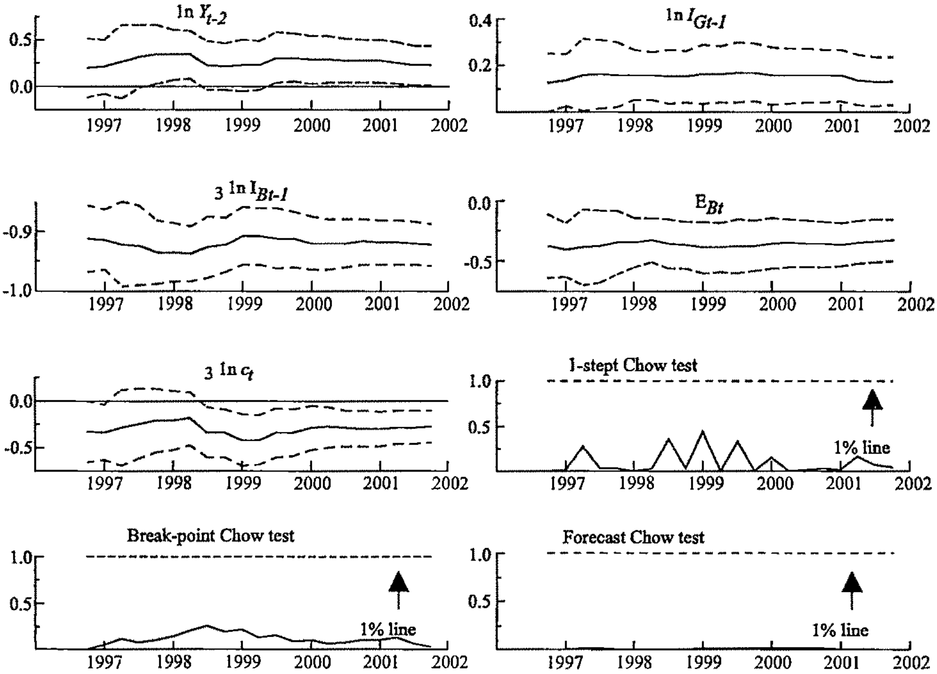
Note: Actual values (solid line) and fitted values (dotted line) in the upper panels; residuals (scaled) in the lower panels.

Table 2. **Diagnostic Test of Estimated Business Investment Equation (sample period 1994Q4 – 2001Q4)**

	OLS Estimate		**IV Estimate**	
	$\sigma_{\hat{u}}$=0.0716866		$\sigma_{\hat{u}}$=0.0719967	
Null Hypotheses (H0)	**Test Statistics**	**[p value]**	**Test Statistics**	**[p value]**
$\hat{u}$ No Autocorrelation	F(3,20) = 0.20735	[0.8901]	F(3,20) =0.18584	[0.9048]
$\hat{u}$ Normality	$\chi^2(2)$ = 1.3371	[0.5125]	$\chi^2(2)$=0.75317	[0.6862]
$\hat{u}$ Homoscedasticity	F(10,12) = 0.82227	[0.6164]	F(10,12) =0.82033	[0.6179]
RESET	F(1,22) = 0.11970	[0.7326]	$\chi^2(1)$ =1.0594	[0.3034]

The long-run coefficients $\alpha_1 = 1$ and $\alpha_2 = -1$ in E_B are imposed after observing that these values are within the 95 percent confidence intervals of the long-run estimates of α_1 and α_2 during model reduction. The resulting long-run equilibrium equation confirms the a priori supposition of a constant return to scale, Cobb-Douglas technology in (2) of Section IIA,[13] suggesting strongly that aggregate business investment demand is now largely market-driven in the PRC. However, the recursive graph (Figure 3) of the short-run effect of the user cost of capital reveals that this variable becomes significant and relatively constant only after 1998, indicating that dominance of the market pricing signals is a fairly recent phenomenon. This may explain why the cost variable is found insignificant in Qin and Song (2003), as their model is focused on long-run factors and estimated using the annual data of 1989-2000.

Figure 3. **Recursive Estimation Results of Business Investment**



Note: Actual values (solid line) and fitted values (dotted line) in the upper panels; residuals (scaled) in the lower panels.

The presence of ln c in (9') carries interesting policy implications, as it includes two important policy instruments, namely interest rate and tax rate (see equation [3]). Equation (9') shows that reduction of interest rate and/or tax rate would stimulate business sector investment by reducing the user cost of capital. This equation also shows that it takes around three quarters of a year for the business sector investment to adjust and absorb such policy shocks through the long-run equilibrium error variable (i.e., the feedback coefficient being –0.3259). Investment models built on annual data could therefore be ineffective for such policy analyses. Obviously, more precise policy analysis about the magnitude and dynamics of the impact of various interest rate and tax rate shocks entails simulation of a whole macro model. Nevertheless, the result is encouraging for further quantitative policy studies. Such studies are badly needed in view of the recent debates among the PRC's economists concerning the feasibility of monetary policy versus fiscal policy in combating deflationary pressure and bad bank loan problems (e.g., see Yu 1999).

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[13] The result of $\alpha_1 = 1$ is also confirmed by Song et al. (2001) and Qin and Song (2003).

Noticeably from (9'), government direct investment is absent from the long-run solution but exerts a positive short-run impact with a three-month lag. This can be regarded as a distinct feature of a transitional economy, as it shows that active fiscal policy via direct investments feeds its effect through business investment within one year, and that the effect is "crowd in" by nature, instead of the conventionally expected crowding-out effect (see Dornbusch 2001). This result is fairly consistent with the recent empirical findings by Atukeren (2004) on the interactions between public and private investment from a number of developing economies. In particular, this result helps to explain why the PRC's aggregate investment dynamics is so volatile: any changes in the government investment get propagated quickly in the business investment.

C. Government Direct Investment Model

Before estimating (10), (8) must be estimated in order to measure the unobservable long-run production trend, Y^T. Equation (8) is rewritten in terms of the actual output:

$$\begin{aligned}\ln Y_t &= \ln A + \theta \ln K_t + (1-\theta)\ln L_t + E_t^T \\ \ln\left(\frac{Y}{L}\right)_t &= \ln A + \theta \ln\left(\frac{K}{L}\right)_t + E_t^T\end{aligned} \tag{8'}$$

where $E_t^T = \ln(Y/Y^T)_t$ and is expected to be weakly stationary. Estimation of θ and A takes two steps. First, obtain the long-run solution from the OLS estimation of a 4-lag ADL of the lower equation of (8'):

$$\widehat{\ln\left(\frac{Y}{L}\right)_t} = -\underset{(2.692)}{2.3056} + \underset{(0.24)}{0.9516}\ln\left(\frac{K}{L}\right)_t \tag{8''}$$

The unit-root test on E_t^T rejects nonstationarity, as shown in Table 1. Next, use E_{t-1}^T as the equilibrium-correcting variable in a 4-lag ECM of the upper equation of (8') to make sure that E_t^T indeed exerts negatively feedback on the output growth. Notice that $\hat{\theta}$ in (8'') is very large with a relatively wide 95 percent confidence interval (0.46, 1.20). This parameter is normally found to be well below 0.5 in most market economies. Such a large capital elasticity reflects the persistent problem of overemployment in the PRC, which makes capital the dominant input constraint on the whole. However, the problem should alleviate as a market economy becomes established. In view of model forecasting, we experiment with downward adjustment of θ within its confidence interval during the second step of ECM modeling. The adjustment aims at finding the minimum acceptable value of the elasticity to sustain a parsimonious and meaningful ECM. The resulting estimate settles at $\hat{\theta} = 0.85$.

The search for a parsimonious and economically meaningful (10) follows exactly the same procedure as used in obtaining (9') and yields the following:

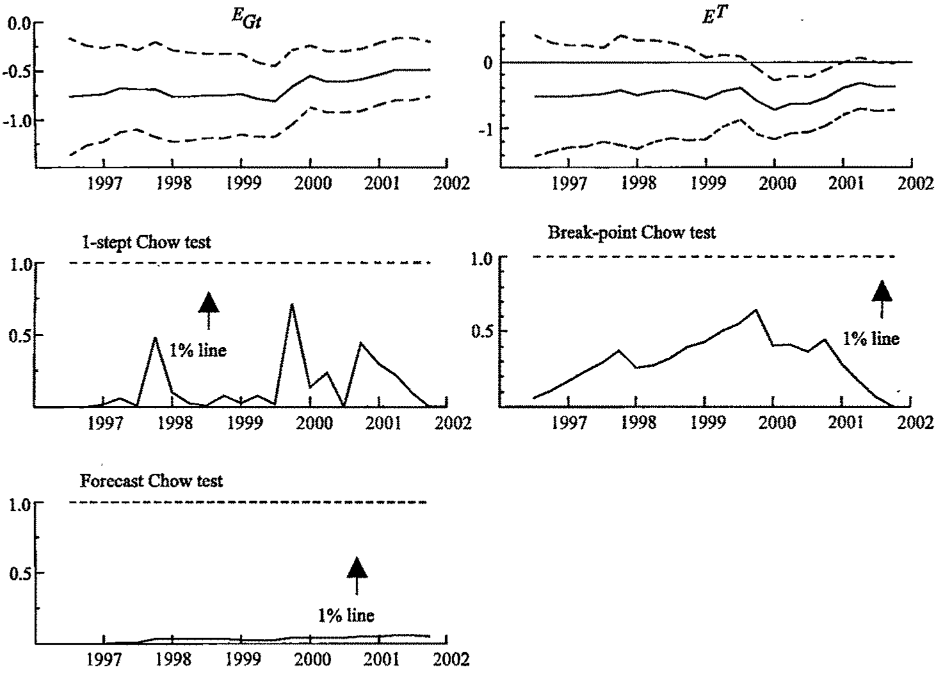
$$\begin{aligned}\Delta \hat{\ln} I_{Gt} &= \underset{(0.109)}{1.096} - \underset{(0.177)}{0.3759} E_{t-1}^T - \underset{(0.143)}{0.4838} E_{Gt-1} - \underset{(0.111)}{2.07} S_1 - \underset{(0.144)}{0.3103} S_2 - \underset{(0.0626)}{0.7429} S_3 \\ E_{Gt} &= \ln I_{Gt} - 0.5 \ln G_{Rt} - 0.7 u_t\end{aligned} \qquad (10')$$

where S_1, S_2 and S_3 are seasonal dummies of the three quarters, respectively. Diagnostic tests of (10') are reported in Table 3. The actual and fitted values, together with the residuals are plotted in Figure 2. Recursive estimation results are given in Figure 4.

Table 3. **Diagnostic Test of Estimated Government Direct Investment Equation (sample period 1994Q1 – 2001Q4)**

	$\sigma_{\hat{u}} = 0.123718$	
Null Hypotheses (H₀)	**Test Statistics**	**[p value]**
$\hat{u}$ No Autocorrelation	F(3,23) = 0.28111	[0.8385]
$\hat{u}$ Normality	$\chi^2(2)$ = 0.30267	[0.8596]
$\hat{u}$ Homoscedasticity	F(7,18) =0.65625	[0.7052]
RESET	F(1,25) =0.39184	[0.5370]

Figure 4. **Recursive Estimation Results of Government Direct Investment**



Notes: For a description of the various plots, see the notes in Figure 3.

It is confirmed in (10') that government investment is constrained by budgetary revenue in the long run, but the elasticity is quite small, $\hat{\beta}_1 = 0.5$. This reflects the gradual withdrawal of the state from ordinary investment projects during the reforms. Unemployment is found to exert a long-run effect with a semi-elasticity of $\hat{\beta}_3 = 0.7$. This fairly large semi-elasticity suggests that persistent employment pressure remains a top concern in government investment planning. The relatively large disequilibrium-correcting coefficient of -0.4838 reflects a very speedy investment plan adjustment process by the state, well within a one-year period. As E_t^T (i.e., the GDP gap) is stationary, its impact on the government investment is short-run and found with a one-quarter lag. The negative response of $\hat{\beta}_2 = -0.3759$ shows that stabilizing and maintaining economic growth also plays an important role in government investment planning. These results show again that models built on annual data would not be of much use for policy analysis. Finally, the strong seasonal effects confirm the earlier description of the uneven seasonal distribution of investment in government budgetary plans.

IV. CONCLUSION

Disaggregation of business sector investment and government direct investment enables economically meaningful structural equations for these two parts of the PRC's aggregate domestic investment. A number of interesting observations can be drawn from the econometric results.

First, business sector investment is largely determined by market forces. Remarkably, the long-run equilibrium relation for investment demand is found to follow the standard theory of a constant return to scale, Cobb-Douglas production function. However, signs of the PRC economy in transition are discernible from the significant, short-run stimulus of the government direct investment growth rate, as well as from the growing significance of the user cost of capital variable over time. These mixed-economy features carry interesting policy implications. The short-run "crowding-in" effect of government investment helps to explain why aggregate investment in the PRC has been more volatile than what is expected normally of the investment series from a market economy. The significance of the cost variable in both the long run and the short run provides a potential to simulate policy impact on aggregate investment via two instruments: interest rate and tax rate.

Second, government direct investment is found to bear strong planned features. While bounded by government revenue in the long run, government direct investment is very responsive to unemployment. It is also significantly responsive to the GDP gap. The significance and the coefficient signs of these two policy targets confirm that the PRC government still resorts heavily to planned fixed investment as a major countercyclical measure to smooth economic growth. The finding that changes in government investment transmit positively and swiftly into the domestic business sector investment justifies the government's reliance on such a fiscal policy instrument. The very active use of the instrument also distinguishes the role of the PRC's fiscal policy from the normal roles of fiscal policies currently used by many other market economies.

Third, the empirical equations are obtained not only on the basis of their economically interpretable specification but also on the basis of their relatively constant coefficient estimates and good Chow forecasting test results, in addition to satisfactory diagnostic test results. Coefficient invariance boosts confidence in using the equations for short-term forecasting. More importantly, it provides empirical validation to use the equations for policy simulation, since the invariance is a vital condition for super exogeneity of the exogenous variables, i.e., to assure that the equations are unlikely to suffer from the Lucas critique when used in policy simulation (see Engle et al. 1983).

Finally, adjustment of both types of investment to short-run dynamic shocks is found to be quite speedy, mostly within one year. This suggests that macroeconometric models built on annual data would not be very useful for policy simulation and forecasting analysis.

APPENDIX: VARIABLE DEFINITION AND SOURCE

Variable Name	Definition	Source
I_B	Real business fixed investment defined as fixed capital investment, excluding government investment and foreign direct investment and divided by the fixed investment price index. Measured in 100 million *yuan.*	CMEI
Y	Real GDP defined as nominal GDP divided by GDP deflator.	CMEI
I_G	Real government investment defined as government investment divided by fixed investment price index.	CMEI
G_R	Real government revenue defined as nominal government revenue divided by GDP deflator. Measured in 100 million *yuan.*	CMEI
P	GDP deflator.	CMEI
P_k	Fixed investment price index.	SYC and CMEI
δ	Depreciation rate of fixed assets.	Estimated
r	Annual nominal interest rate of lending adjusted on daily average within the corresponding quarter. Measured in percentage point.	QB
u	Rate of unemployment. Measured in percentage point.	Calculated
τ	The sum of value-added taxes, consumption taxes, business taxes, and enterprise income taxes divided by GDP. Measured in percentage point.	CMEI
L	Employment. Measured in 10 thousands.	SYC
L_s	Economically active population. Measured in 10 thousands.	SYC
K	Fixed capital stock. Measured in 100 million *yuan.*	YFIC

Notes: (1) P_k is only given in half year and annual; it is assumed that the price changes gradually within a half-year period.

(2) The amount of capital formation at the end of 1991, given in YFIC, is used to calculate K in the following period by using $K_t = K_{t-1} * (1-\delta) + I_t$.

(3) L and L_s are only given in annual data; it is assumed that they change gradually within a year.

(4) δ is taken as a constant of 5 percent.

Sources: National Bureau of Statistics: *Statistics Yearbook of China* (SYC), *China Monthly Economic Indicators* (CMEI), *Yearbook of Fixed Investment of China 1950-1995* (YFIC); People's Bank of China: *Quarterly Banking* (QB).

REFERENCES

Atukeren, E., 2004. "Interactions between Public and Private Investment: Evidence from Developing Countries." Paper presented in EcoMod International Conference on Policy Modeling, Paris, June.

Caballero, R. J., 1999. "Aggregate Investment." In J. B. Taylor and M. Woodford, eds., *Handbook of Macroeconomics*, Vol. II. North-Holland: Elsevier Science B.V.

Cong, L., 2002. "Aggregate Supply Function of China" (in Chinese). Chinese Academy of Social Sciences, Beijing. Ph. D. thesis.

Doornik, J. A., and D. F. Hendry, 2001. *Empircal Econometric Modeling Using PcGive.* London: Timberlake Consultants Ltd.

Dornbusch, R., S. Fischer, and R. Startz, 2001. *Macroeconomics,* 8th ed. Boston: The McGraw – Hill Book Co.

Engle, R. F., D. F. Hendry, and J. F. Richard, 1983. "Exogeneity." *Econometrica* 51:277-304.

Hendry, D. F., 1995. *Dynamic Economics.* Oxford: Oxford University Press.

National Bureau of Statistics, 1997. *Yearbook of Fixed Investment in China 1950-1995* (in Chinese). Beijing: China Statistics Publishing House.

———, 2000-2004. *China Monthly Economics Indicators,* Vol. 1-50 (in Chinese). Beijing: Office of China Monthly Economics Indicators.

———, 2003. *Statistical Year Book of China* (in Chinese). Beijing: China Statistics Publishing House.

Oliner, S., G. Rudebusch, and D. Sichel, 1995. "New and Old Model of Business Investment: A Comparison of Forecasting Performance." *Journal of Money, Credit and Banking* 27:806-26.

People's Bank of China, 1999-2002. *The People's Bank of China Quarterly Statistical Bulletin,* Vol. 1-35 (in Chinese). Beijing: People's Bank of China.

Qin, D., 2003. "Determinants of Household Savings in China and Their Role in Quasi-money Supply." *The Economics of Transition* 11:513-37.

Qin, D., and H.-Y. Song, 2003. "Excess Investment Demand and Efficiency Loss during Reforms: The Case of Provincial-level Fixed Asset Investment in China" (in Chinese). *China Economic Quarterly* 2:807-31.

Romer, D., 2001. *Advanced Macroeconomics.* Boston: McGraw-Hill Higher Education.

Shang, M., 2000. *Fifty Years of Monetary Finance in New China* (in Chinese). Beijing: China Finance & Economics Publishing House.

Shen, L., 2000. "China's Macro Econometric Annual Model." In L. R. Klein and S. Ichimura, ed., *Econometric Modeling of China.* Singapore: River Edge; New Jersey: World Scientific Publishing Co. Pte. Ltd.

Shen, L. et al., 1999. "China Macroeconomic Annual Model." In H. Wang, B. Li, and S. Li, eds., *China Available Macroeconomic Models.* Beijing: China Finance & Economics Publishing House.

Song, H. Y., Z. N. Liu, and P. Jiang, 2001. "Analyzing the Determinants of China's Aggregate Investment in the Reform Period." *China Economic Review* 12:227-42.

Sun, L. X., 1998. "Estimating Investment Functions Based on Cointegration: The Case of China." *Journal of Comparative Economics* 26:175-91.

Wang, Y., ed. 2002. "Twenty Years of Price Reforms: Review and Forecast." In *Twenty Years of Price Reforms* (in Chinese). Beijing: China Planning Publishing House.

Xiang, H. C., 1999. *Fifty Years of State Finance in China* (in Chinese). Beijing: China Finance & Economics Publishing House.

Yu, Y., 1999. "Break the Vicious Circle of Deflation" (in Chinese). *Economic Research* 375:3-9.

———, 2004. "China's Macroeconomic Situation since 2003." *China and World Economy.* Forthcoming.

Zhu, B., and Y. Liang, 1999. "China Macroeconomic Model (Project LINK)." In H. Wang, B. Li, and S. Li, eds., *Macroeconomic Models of China in Practice.* Beijing: China Finance & Economics Publishing House.

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Development Strategies for Inclusive Growth in Developing Asia

JUSTIN YIFU LIN

A continuous flow of technology/ industrial innovation is the key to sustained dynamic growth. Developing countries have an "advantage of backwardness" as they can borrow technology/industry from the developed countries. In an open, competitive market, the optimal technology/industrial structure of a country is endogenously determined by the country's endowment structure, which is exogenously given at any specific time. However, the governments in most developing countries after World War II adopted an inappropriate development strategy to accelerate the build-up of developed countries' capital-intensive industries, which deviated from the optimal technology/industrial structure determined by their own endowment structures. This strategy made firms in the priority sectors nonviable in an open, competitive market and was responsible for many policy distortions and for failures in catching up and achieving inclusive growth. A transition to a policy regime that facilitates industrial development along the countries' comparative advantages is necessary for developing countries to improve their growth performance and to allow the poor to benefit from growth. As many distortions in the developing countries are endogenous to the viability problem of firms in the priority sectors of previous development strategies, governments have to find a way to resolve the firms' viability problem to achieve dynamic growth in their transition processes.

I. INTRODUCTION

One of the most outstanding achievements in the history of world economic development in the 20th century was that several of Asia's countries and regions were able to create economic miracles and catch up with western developed countries. Table 1 shows that Japan and the newly industrialized economies in East Asia, including Hong Kong, China; Republic of Korea (Korea); Singapore;

Justin Yifu Lin is Professor and Founding Director of the China Center for Economic Research at Peking University and Professor of Economics at Hong Kong University of Science and Technology. This paper was prepared for the Asian Development Bank's Distinguished Speakers Program held on 11 October 2004 in Manila, Philippines. The original lecture style of presentation has been preserved. This paper draws heavily on the author's 2003 and 2004 papers, "Development Strategy, Viability, and Economic Convergence," *Economic Development and Cultural Change* 51(2, January):277-308; and "Development Strategy, Transition and Challenges of Development in Lagging Regions," in F. Bourguignon and B. Pleskovic, eds., *Annual World Bank Conference on Development Economics 2004: Accelerating Development (Bangalore Conference Proceedings),* World Bank, Washington, DC.

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and Taipei, China, whose initial conditions after World War II were not more favorable than other developing countries in other parts of the world (Maddison 2001), have become the only group of economies that have successfully reached the per capita income level of western developed countries or substantially narrowed their income gaps with developed countries. However, as shown in Figure 1, for Asia as a whole, like most other parts of the world, the gaps between their per capita income and that of the developed countries in effect have widened after World War II. In 2002, there were about 690 million people in Asia still in extreme poverty, living on less than US$1 a day. If a more generous standard of $2 a day was used, 1.9 billion Asians, or about half of the population in Asia, were poor in that year (ADB 2004). Those poor people have no guarantee for their basic daily nutrition needs, access to improved sanitation, and so on. How to eradicate poverty and how to close the income gaps between developing Asia and the developed countries are daunting challenges for the region.

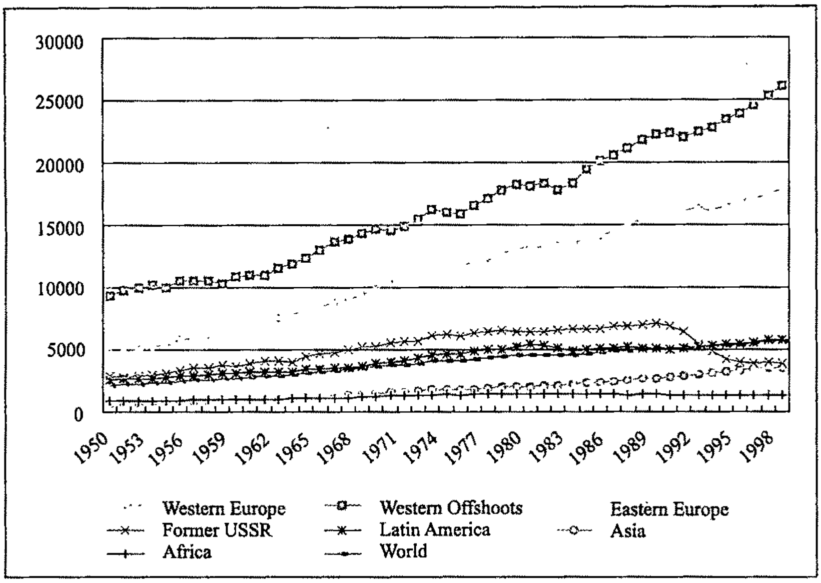
In this lecture, I would like to argue that for the countries in developing Asia, like developing countries in other parts of the world, if their governments adopt the right development strategy, they have good opportunities to achieve dynamic growth and equitable income distribution in the process of development. However, many of them followed an inappropriate strategy and impeded their opportunities to realize this growth potential. I would also like to propose an approach for developing countries to transit from the old to the new development strategy smoothly.

Table 1. **Per Capita GDP in 1970 and 2003 (current US dollars)**

	1970		**2003**	
	Per Capita GDP	**Per Capita GDP as a Percentage of the Level in North America (%)**	**Per Capita GDP**	**Per Capita GDP as a Percentage of the Level in North America (%)**
Asia	237	4.95	2416	6.71
Japan	1982	41.37	33819	94.00
Hong Kong, China	978	20.41	22618	62.87
Korea	275	5.74	11059	30.74
Singapore	914	19.08	21195	58.91
Taipei,China	386	8.06	12680	35.24
Africa	233	4.86	759	2.11
Europe	1854	38.70	16772	46.62
Northern America	4791	100.00	35977	100.00
World	881	18.39	5751	15.99

Source: United Nations Statistical Division.

Figure 1. **Per Capita GDP in 1990 International Geary-Khamis Dollars, 1950-1998**



Source: Maddison (2001, 330).

My main arguments are as follows: A continuous flow of technology/industrial innovation is the key to sustained dynamic growth by any country. Developing countries have an "advantage of backwardness" as they can borrow technology/industry from the developed countries. However, in an open, competitive market, the optimal technology/industrial structure of a country is endogenously determined by the country's endowment structure, which is exogenously given at any specific time. Therefore, to benefit from the advantage of backwardness, a developing country needs to have an appropriate strategy that guides their technology/industrial borrowing from the developed countries. However, the governments in most developing countries after World War II adopted an inappropriate development strategy that defied their comparative advantages determined by their endowment structures, for the purpose of building up the developed country's capital-intensive industries on a relatively capital-scarce endowment structure. This strategy made firms in the priority sectors nonviable in an open, competitive market and was responsible for many policy distortions in the developing countries and for failures of developing countries to catch up with the developed countries and achieve inclusive growth. A transition to a policy regime that facilitates industrial development along the countries' comparative advantages is necessary for developing countries to improve their growth performance and to allow the poor to benefit from growth. However, many distortions in the developing countries are endogenous to the viability problem of firms in the priority sectors of previous development strategies. Governments have to find a way to resolve the exogenous cause of those endogenous distortions for their transition process to be smooth.

This lecture is organized as follows: Following the introduction, Section II reviews the literature on the determinants of economic growth. Section III analyzes the impacts on firm viability, distortions, and economic and social consequences of a comparative advantage-defying (CAD) strategy adopted by a developing country's government. Section IV discusses the effect of such strategy on the poor in developing Asia. Section V explores an alternative comparative advantage-following (CAF) strategy and what the government role is in this strategy. Section VI discusses the appropriate approach for transiting from a CAD strategy to a CAF strategy. Some concluding remarks are provided in Section VII.

II. LITERATURE REVIEW

Why developing countries cannot catch up with the developed countries has been a challenging question and puzzling phenomenon to economists. The neoclassical growth theory (Solow 1956), with its assumption of exogenously given technology, predicts that a developing country would grow faster than the developed countries, that per capita income in less developed countries (LDCs) would converge to the level of developed countries, and that GDP growth rate in any country will eventually be the same as its population growth rate. However, with a few exceptions in East Asia, most developing countries' per capita income failed to converge to the level in developed countries (Pearson et al. 1969, Romer 1994), and the economic growth rates in developed countries continue to exceed their population growth rates. Unsatisfied with the neoclassical growth theory, Romer (1986) and Lucas (1988) pioneered the new growth theory, which treats technological innovation as endogenously determined by the accumulation of human capital, research and development (R&D), learning by doing, and so on, and argues that the failure of LDCs to converge to developed countries is due to their lack of investment in those factors that are important for technological innovations. The argument of this theory is insightful for the continuous growth of per capita income in developed countries. Nevertheless the new growth theory fails to provide a satisfactory explanation for the extraordinary growth and convergence of the newly industrialized economies in Asia, including recently People's Republic of China, during the last three decades of the 20th century (Pack 1994, Grossman and Helpman 1994). During the catching up process, these newly industrialized economies' investments in R&D, human capital, and learning by doing were much lower than those of the developed countries.

Many economists now believe that the developing countries failed to catch up with the developed countries because of bad institutions due to government interventions and regulations, including widespread corruption, weak protection to investors, and high degree of social conflicts (Shleifer et al. 1998; Rodrick

1998; Acemoglu et al. 2001a, 2001b, 2002a, 2002b; Djankov et al. 2002 and 2003). As Rodrick (2003, 7) stated, "institutions have received increasing attention in the growth literature as it has become clear that property rights, appropriate regulatory structure, quality and independence of the judiciary, and bureaucratic capacity could not be taken for granted in many settings and that they were of utmost importance to initiating and sustaining economic growth."

Many economists have tried to understand how government intervention and regulation occurs and how and whether it can be subsequently sustained (Rodrik 1996). The classical theory for the role of government (Pigou 1938) has been called the "helping hand" view. An alternative strand of the "grabbing hand" view (Shleifer and Vishny 1998) holds that government interventions are pursued for the benefit of politicians and bureaucrats. Politicians use regulation to favor friendly firms and other political constituencies, thereby obtaining campaign contributions and votes. In addition, "an important reason why many of these permits and regulations exist is probably to give officials the power to deny them and to collect bribes in return for providing the permits" (Shleifer and Vishny 1993, 601). A recent paper presented by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2002) provides an empirical test on the theories of the grabbing hand, say, the barrier for business entry might arise from the corruption of bureaucrats.[1] Other economists attribute the government's interven-tions and regulations to the legal origin (La Porta et al. 1998 and 1999) and colonial institutional inheritance (Acemoglu et al. 2001a, b; Engerman and Sokoloff 1997).[2]

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[1] This grabbing hand hypothesis may not be appropriate for most interventions and regulations in developing countries. Suppose that the government's regulations in the developing countries could arise from the grabbing hand of government, or political elites. The unsolved question in the literature is how to understand the evolution of institutional structure under government interventions. In developing countries, the institutional structure shaped by government interventions is so complicated. We wonder what the incentives for political leaders to design such complicated systems are, because the increase of costs of expropriations and political control due to the complexity of institutions would diminish the gains of the grab. Corruption induced by special interest groups might not be a good answer for this question either, because the benefited groups are often taxed or suppressed alongside the protections/subsidies. Moreover, many interventions do not have obvious beneficiary groups.

[2] If a developing country's existing institution that is detrimental to economic growth is endogenous to colonial heritage or natural endowment, knowledge is not useful for development policy as we can do nothing at the present time about the colonial heritage or natural endowment from several hundred years ago.

III. COMPARATIVE ADVANTAGE-DEFYING STRATEGY, VIABILITY, AND ENDOGENOUS DISTORTIONS

I agree that poor economic performance in developing countries is attributable to inappropriate interventions and regulations. However, I would like to propose an alternative hypothesis for the existence of government interventions and regulations in developing countries. My argument is based on the conflicts between the government's development strategy in a developing country and the country's endowment structure (Lin 2003).

As suggested by Kuznets (1966), a continuous innovation and upgrading of technology and industries is key to dynamic growth in any economy in modern times. A developing country could have an advantage in speed of technology innovation than a developed country because the developing country could have a low-cost, low-risk technology "borrowing" from the developed country, whereas the developed country needs to engage in high-cost and high-risk invention to obtain technology innovation (Hayami 1997). The higher speed of technology innovation will enable the developing country to have a higher return to capital, resulting in a high rate of capital accumulation, industrial upgrading, and a larger room to reallocate labor and other resources from low value-added industries to high value-added industries. Consequently, a developing country could potentially have a higher economic growth rate than developed countries and achieve convergence with the developed countries. However, whether or not a developing country could benefit from the "advantage of backwardness" very much depends on the government's development strategy and the resulting economic policy regimes.

Generally speaking, the government is the most powerful and important institution in a developing country. Its economic policies shape the macro incentive structure for every economic agent in the country. However, the development strategy with its resulting interventions and regulations adopted by governments in most developing countries after World War II denied opportunities to benefit from the "advantage of backwardness."

Many of the early generation of political leaders in both socialist and nonsocialist developing countries, such as Nehru in India, Nasser in Egypt, Sukarno in Indonesia, Mao Zedong in People's Republic of China (PRC), and Ho Chi Minh in Viet Nam, were elites taking part in the independent movements or revolutions for the purpose of nation building. The institutions laid down by the early generation of political leaders were endogenously shaped by the conflicts between the elites' ambitious drives of industrialization/modernization for nation building and their nations' economic realities. The key to the argument is the viability issue of firms in the priority sectors of government's industrialization drives.[3]

The term viability is defined as follows: "If, without any external subsidies or protections, a normally managed firm is expected to earn socially acceptable profits in a free, open, and competitive market, then the firm is viable. Otherwise the firm is nonviable" (Lin 2003, 280). It is obvious that no one will invest in a firm if it is not expected to earn a socially acceptable normal profit. Such a firm will exist only if the government gives it financial support or protection.

In an open, competitive market, the management of a firm will affect its profitability, which is a known proposition. However, the expected profitability of a firm also depends on its industry/technology choice.

To illustrate this idea, I will discuss the case of a simple economy that possesses two endowments, capital and labor, and produces one product. As shown in Figure 2, each point on the isoquant represents a production technology or a combination of capital and labor required to produce a given amount of a certain product. The technology represented by A is more labor-intensive than that of B. C, C_1, D, D_1 are isocost lines. The slope of an isocost line represents the relative prices of capital and labor. In an economy where capital is relatively expensive and labor is relatively inexpensive, as represented by isocost lines C and C_1, the adoption of technology A to produce the given amount of output will cost the least. When the relative price of labor increases, as represented by the isocost lines by D and D_1, production will cost least if technology B is adopted.

In a free, open, and competitive market economy that produces only one product as illustrated in Figure 1, a firm will be viable only if it adopts the least-cost technology in its production. In Figure 1, if the relative prices of capital and labor can be presented by C, the adoption of technology A costs the least. The adoption of any other technology, such as B, will have a higher cost. Market competition will make firms that adopt technologies other than A nonviable. Therefore, in a competitive market with given relative prices of labor and capital, the viability of a firm depends on its technology choice.

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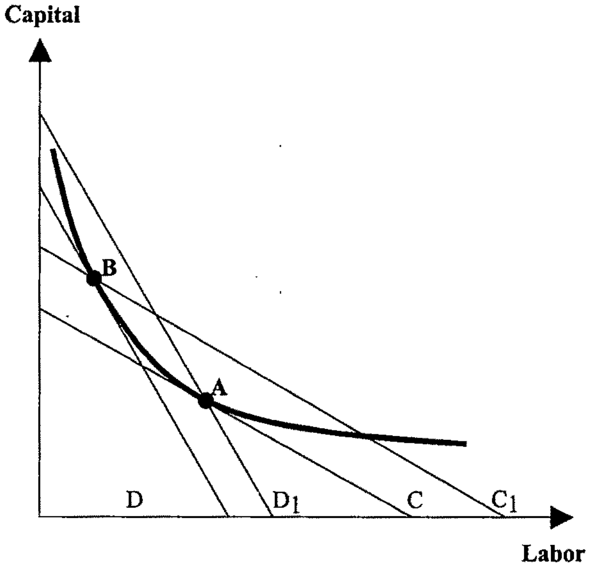
[3] The bureaucrats in lower levels of government in a developing country may subsequently use the interventions/regulations endogenous in the nation-building attempt for their personal grabbing-hand purpose. However, the grabbing hand of bureaucrats should be viewed as a consequence instead of the cause of the distortions and regulations that wwere created by the first-generation leaders who did not have much personal purposes other than the dream of nation building. Similarly, various groups may subsequently take advantage of these interventions/regulations and seek rents to benefit themselves. However, the vested interest group's rent seeking was an unintended consequence instead of the first generation leaders' motivation for the interventions/regulations.

Figure 2. **Relative Price of Production Factors and Technique Choice**



In a competitive market, the relative prices of capital and labor are determined by the relative abundance/scarcity of capital and labor in the economy's factor endowments. When labor is relatively abundant and capital is relatively scarce, the isocost line will be something like that of line *C* in Figure 2. When capital becomes relatively abundant and labor relatively scarce, the isocost line will change to something like line *D* in Figure 2. Therefore, the viability of a firm in an open, competitive market depends on whether its choice of technology is on the least cost lines determined by the relative factor endowments of the economy.

The above analysis can be extended to a multiproduct and multi-industry case. In an open, competitive market, whether a firm is viable depends on whether the firm's industry, product, and technology choices are consistent with the comparative advantages determined by the economy's endowment structure.[4] If a firm's choices are not consistent with this condition, the firm cannot earn acceptable profit in an open, competitive market even under normal management and its survival will rely on government subsidies and/or protection.

It is important to note from the above discussion that in an open, competitive market, without government intervention, only viable firms will exist.

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[4] It is worth noting that the viability of a firm and the comparative advantages of an economy are highly related. Viability is a concept that focuses on a firm's technology, product, and industry choices in a competitive market, whereas comparative advantage refers to the competitiveness of an economy's product/industry in an open economy. However, both are determined by the country's endowment structure.

Therefore, an economy's industry, product, and technology structure in an open, competitive market is in effect endogenously determined by the economy's endowment structure.

Most developing countries are characterized by relative abundance of labor and scarcity of capital.[5] As such, in an open, competitive market, the structure of industry and technology in a developing country will be relatively labor-intensive. However, unaware of the endogeneity of the industrial/technology structure and inspired by the dream of nation building, political leaders, economists, and social elites alike in developing countries often aim, as their development drive, the build-up capital-intensive industries and adoption of advanced technologies similar to those of developed countries within the shortest period. I call such type of development approach comparative advantage-defying strategy because the government attempts to encourage firms to ignore the existing comparative advantages of the economy in their choice of industry and technology.[6] Most firms in the priority sectors of a CAD strategy are not viable in open, competitive markets. Therefore, the developing country's government has to subsidize and protect those firms through various interventional measures.

If a government adopts a CAD strategy and the deviation of the firms' choices of technology/industry from the optimal ones determined by the economy's endowment structure is small, and the number of nonviable firms that the government attempts to support is limited, the government may subsidize the firms directly by tax transfers as in the case of agricultural protection in many countries of the Organisation for Economic Co-operation and Development. However, when a developing country's government adopts a CAD strategy, the distance of deviation from their comparative advantages is often very large, the number of nonviable firms numerous, and the government's taxation capacity very weak. The developing country's government often turns toward implicit measures of subsidies through price distortions, limitations on market competition, direct administrative allocation of resources, and so on.[7] As a matter of fact, the traditional planning systems that existed before economic transition in the socialist economies were typical institutional arrangements for supporting and protecting the nonviable heavy-industry firms (Lin, Cai, and Li 1994, chapter 2).

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[5] The other possibility for a less developed country is relative abundance in natural resources and relative scarcity in capital and labor. The discussions and conclusions in this paper can be easily extended to cover such case.

[6] The CAD strategy includes the heavy-industry-oriented development strategy in the socialist countries and in developing countries, such as India, and the secondary import substitution strategy in many Latin American and African countries. The strategy also includes the protection of certain industries that have lost comparative advantage due to development of the economy, such as protection of agriculture in many countries of the Organisation for Economic Co-operation and Development.

[7] From the above perspective, the root of intervention in a developing country is not the grabbing hand of government officials or the manipulation of interest groups but the dream of nation building of political elites. Corruption may be an endogenous phenomenon of the distortions and interventions arising from the conflict between the economy's endowment structure and the political leaders' ambitious and unrealistic development attempts. From this

Moreover when a developing country's government adopts the CAD strategy, the government cannot exactly know how large the subsidies would be due to information asymmetry. The firms in the priority sector will have incentives to use their viability problem as an excuse and use resources to lobby the government officials not only for more ex ante policy favors, such as access to low-interest loans, tax reductions, tariff protection, and legal monopolies but also for ex post ad hoc administrative assistances, such as more preferential loans or tax arrears. The economy will be full of rent-seeking activities and corruption. Because the firms can use the viability problem as an excuse to bargain for more government support and because it is hard for the government to shun such responsibility, the firm's budget constraints become soft (Lin and Tan 1999).[8] When the soft budget constraint exists, the firm will face no pressure to improve productivity and the firm's efficiency will be low. Moreover, with the subsidies/protections and soft budget constraints for the firms in the priority sectors, entry into those sectors becomes a privilege. The political leaders in a nonsocialist developing country may select their own close friends or political supporters to invest in those priority sectors, resulting in the phenomenon of crony capitalism.

Besides, if the government in a developing country adopts the CAD strategy, the economy will become more inward-oriented than otherwise. This is because the CAD strategy attempts to substitute the import of capital-intensive manufactured goods through domestic production, causing the reduction of imports. Exports will also be suppressed due to the inevitable transfers of resources away from the industries for which the economy has comparative advantage to the priority sectors of the CAD strategy. The exchange rates are likely to be overvalued to facilitate the import of technology/equipment for priority industries, effectively hampering export opportunities. In addition, under the CAD strategy, the carriers of a government's development strategy are normally large firms. To support the financial needs of nonviable large firms, the

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perspective, the political target should be separated from the corruption view of the grabbing hand approach or the "Leviathan" approach.

[8] The soft budget constraint is a term coined by Kornai (1986) to explain the problem in the socialist countries. According to Kornai, the soft budget constraint arises from the paternalistic nature of the socialist government toward the state-owned firm. His argument cannot explain why the soft budget constraint exists in nonsocialist economies and why the soft budget constraint still exists 10 years after privatization in Russia and Eastern European transitional economies (World Bank 2002). Dewatripont and Maskin (1995) argue that the soft budget constraint arises from banks' imperfect information on investment projects and the time-inconsistent problem of the project. However, this argument cannot explain the prevalence and persistence of soft budget constraints in developing countries.

government often nationalizes the firms and uses direct fiscal appropriation, skipping financial intermediation, to support these firms. Such was the case in the former socialist planned economies and continues to be the case in many developing countries. Even if the government relies on private firms to carry on the CAD strategy, the financial needs of large firms will be huge and can only be met by a heavily regulated oligopolistic banking system or an administratively intervened stock market, resulting in the phenomenon of financial depression (McKinnon 1973, Shaw 1969). In either case, the financial system in the country will be very inefficient.

Development of nonviable firms relies heavily on external financial support. The government first mobilizes domestic resources to support these firms through the above interventions in the financial system. Once domestic financial resources are depleted, the government often allows the nonviable firms to turn to international financial markets to support their further development. Fiscal deficits, bad loans, external debts, and financial fragility will be exacerbated, and macroeconomic stability will become unsustainable, leading to eruptions of financial crises (Lin 2000), which may also trigger serious social conflicts and political instability (Rodrik1998, Caselli and Coleman 2002).

From the above discussions, we can see that many of the interventions and regulations and their resulting inefficiency in developing countries are endogenous to the viability problem of the firms in the government's priority sectors.

IV. COMPARATIVE ADVANTAGE-DEFYING STRATEGY AND THE POOR IN DEVELOPING ASIA

The adoption of a CAD strategy is most detrimental to the poor in Asia, most of whom earn a living from agriculture. Table 2 shows that, like other developing countries in the world, more than 70 percent of the population in developing Asia subsisted on agriculture in 1961. However, the arable land per agricultural labor force in developing Asia was only about 45 percent of the world average, and was 20 percent less than the average of the developing countries as a whole.

In addition to the scarcity of arable land endowment, developing Asia is facing another challenging issue. Deforestation, desertification, depletion or contamination of groundwater, soil salinity, soil erosion, and so forth are common problems in many parts of Asia, making the environment fragile.

Table 2. **Population and Arable Land in 1961 and 2002**

	Population (million)			Agricultural Labor Force (million)	Arable Land (million has.)	Arable Land per Agricultural Labor (has.)
	Total	**Rural**	**Agriculture**			
2002						
Asia	3,776	2,321	1,956	1,051	512	0.49
Developing Asia	3,568	2,253	1,934	1,040	474	0.46
Developed Countries	1,325	352	94	45	612	13.51
Developing Countries	4,900	2,882	2,495	1,288	793	0.62
World	6,225	3,234	2,588	1,333	1,404	1.05
1961						
Asia	1,702	1,348	1,243	613	410	0.67
Developing Asia	1,605	1,312	1,214	598	404	0.68
Developed Countries	981	382	253	114	648	5.66
Developing Countries	2,099	1,647	1,542	736	631	0.86
World	3,080	2,030	1,795	850	1,279	1.50

Source: FAO (2004).

The above two problems are interwoven. Most poor people live in the environmentally stressful marginal areas and, the poorer people are, the more likely they would live on the type of agricultural production that is detrimental to the environment. Therefore, in most areas the problem of environmental sustainability and problem of rural poverty need to be solved simultaneously.

In solving the poverty issue it is important to understand that the most important asset of the poor is their own labor. The rich have other assets: land, capital, good education, personal relations, and political-economic network. But for the poor, except for their labor, they may not have other assets that could bring them income. Because of this, unless their labor becomes relatively scarce and valuable, it is impossible to increase their income and improve their social status.

The production activities of rural people living under the poverty line have their own characteristics as well. Because they are poor, they produce mainly farm products, such as grain, which have low income and price elasticity. Because of the low elasticity of income, overall economic growth will have only minimum effects on the demand for farm produce. Because of the low price elasticity, the production increase of an individual rural household may increase household income. However, if most households would increase production, the price will go down, resulting in little effect on the increase of farm income.[9] These two characteristics make the attempt to increase the rural poor people's income by increasing agricultural production through investments in infrastructure and technology ineffective.

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[9] If the increased produce could be exported to international markets, it will help increase the price elasticity of farm produce. Unfortunately, most countries have imposed various barriers for the import of farm produce. Therefore, the opportunity for a developing country to increase its agricultural exports is pessimistic. In addition, the overvalued exchange rate in most developing countries further impairs the competitiveness of their export of farm produce.

In my view the most important way to win the antipoverty war and achieve environmental sustainability in developing Asia is to reduce the rural labor force. When the rural labor force declines, people living on agriculture in rural areas will have more land and resources to work on. At the same time, when the farm workers become nonfarm workers, they will change from suppliers to consumers of agricultural products. The supply curve of agricultural products will thus shift to the left and the demand curve to the right. Consequently, the prices of agricultural products will go up and so will the marginal product value of farm labor and its earnings. The income of rural people will in this way increase as farm labor keeps on decreasing. Apart from this, the reduction of rural labor and the rural population will also help ease the tension between population and the environment, avoiding overpressure on the environment due to production and living activities, which destroy the environment's ability of self-recovery making it unsustainable.

To reduce the rural population and labor force, it is necessary to ensure that people who have stopped farming could find jobs in nonagricultural sectors in urban areas. Otherwise, labor migrated from rural areas will only turn into unemployed urban poor. The overall social welfare will not improve.

Unfortunately, as argued in Section III, the governments of many developing countries in Asia as well as in other parts of the world adopted the CAD strategy to build up the capital-intensive industries. These industries required a large amount of investment but created only a small number of job opportunities, making little room for the absorption of out-migrated rural labor. This will result in either of the following consequences:

(i) The government puts restrictions on migration from rural areas to urban areas, and lets the population under the poverty line stay in rural areas, just as the PRC did before its transition to a market economy in 1979. As such, not only rural poverty will remain but also, with the increase of the rural population and the intensification of living and production activities, environmental conditions worsen.

(ii) The government allows rural people to migrate to urban areas. But since industries in urban areas cannot create enough jobs and job opportunities in the tertiary industries are also depressed due to slow income growth, most rural out-migrants only change from the status of rural poor to urban poor. The urban living environment will also deteriorate.

The operation of nonviable firms in the CAD strategy needs continuous financial support. When the domestic funds are exhausted, the government often allows the nonviable firms to borrow from international sources. But since they are in the CAD sector, it is hard for them to profitably export their product to international markets. When they have to repay foreign loans, financial and monetary crises may occur. Furthermore, due to the development of noncomparative-advantage industries, domestic industries that have the comparative advantages cannot be fully developed for lack of investments. Under these circumstances, if the country is forced to open its doors and adopt a free trade policy, it will be a big shock to the domestic economy. Then, the poor, no matter where they are, will be the group that is most seriously hurt, as what happened in the 1997 Asian financial crisis (Lin 2000). Therefore, in order to catch up with the developed country, to win the antipoverty war in rural areas, and to achieve environmental sustainability, it is imperative to find a new development strategy.

V. COMPARATIVE ADVANTAGE-FOLLOWING STRATEGY AND THE ROLE OF GOVERNMENT

Governments in developing Asia as well as in other developing countries could adopt an alternative strategy, which I call a comparative advantage-following strategy, to encourage firms in the country to enter the industries for which the country has comparative advantages, and to adopt production technologies that will make these firms viable.

When the government adopts a CAF strategy, all the firms existing in the markets are viable and in sectors that are the country's comparative advantages. The firms have no excuse to need government subsidies and protection, reducing the possibility of firms' rent seeking, and the possibility for the government to undergo financial depression just to mobilize resources for the priority sectors. Market competition will force the managers of firms to improve their management or face the danger of being competed out of the markets. Therefore, competition pressure will force existing firms to be competitive domestically and internationally, which in turn enhances the economy's ability to withstand outside shocks. International trade will be more important under the CAF strategy than under the CAD strategy, as the economy under the CAF strategy will import what are not their comparative advantages and export what are their comparative advantages. Openness of the economy will enhance the firms' ability to borrow technology from developed countries, contributing to the realization of the advantage of backwardness. The economy will have a larger surplus, accumulate more capital, and have a faster upgrading of its endowment structure than what is possible under the CAD strategy. The economy will have a better income distribution as well because the CAF strategy will create more job opportunities for the poor and, with dynamic growth and faster accumulation of capital, the labor force will change from relatively abundant to relatively scarce, and wage income will increase faster than under the alternative CAD strategy, creating the desirable consequence of "growth with equity" (Fei, Ranis, and Kuo 1979; Hasan and Quibria 2004).

As discussed in Section III, the industries for which the economy has comparative advantages and the technologies that are appropriate for production are all endogenously determined by the country's factor endowments structure. However, the managers of firms, as micro agents, have no knowledge or concern for the actual endowments. Their only concerns are the prices of their outputs and the costs of their production. They will enter the industry and choose the appropriate production technology only if the relative factor prices correctly reflect the relative factor abundances, which can be achieved only if the markets are competitive. Therefore, when the government in a developing country adopts a CAF strategy, its primary policy is to remove all possible obstacles for the function of free, open, and competitive product and factor markets, as suggested by neoclassical economics.

However, the government in a developing country that adopts the CAF strategy can play a role that is larger than what is required by a minimum government, whose function is limited to maintaining law and order. When the factor endowment structure of the economy is upgraded, firms should upgrade their products, technologies, or industries accordingly from being less capital-intensive to being more capital-intensive. Such technology and industry may already exist in the more developed countries. However, the information for what exact technology and industry to borrow and learn from the advanced countries may not be freely available. It is necessary to invest resources for information search and analysis. If a firm carries out these activities on its own, it will keep the information private, and other firms will be required to make the same investment to obtain the information, hence creating repetition in information investments. However, with information having a public good nature, after the information has been gathered and processed, the cost of information dissemination is close to zero. Therefore, the government can collect the information about new industries, markets, and technology, and make them available in the form of industrial policy for all firms.

The upgrading of technology and industry in an economy often requires coordination of different firms and sectors in the economy. For example, the human capital or skill requirements of new industries/technologies may be different from that used with older industries/technologies. A firm may not be able to internalize the supply of new human capital. Therefore, the success of a firm's industry/technology upgrade also depends on the existence of an outside supply of new human capital. In addition to human capital, the firms that are upgrading their technology and industries may also require new financial institutions, trading arrangements, marketing and distribution facilities, and so on. Therefore, the government may also use industrial policy to coordinate firms in different industries and sectors to make necessary investments for the upgrade of industry/technology in the economy.

The upgrading of industry/technology is an innovation, and it is risky by nature. Even with the information and coordination provided by the government's industry policy, a firm's attempt to upgrade its industry/technology may fail due to the upgrade being too ambitious, the new market being too small, the coordination being simply inadequate, and so forth. The failure will indicate to other firms that the targets of the industrial policy are not appropriate, and, therefore, they can avoid that failure by not following the policy. That is, the first firm pays the cost of failure and produces valuable information for other firms. If the first firm succeeds, the success will also provide externalities to other firms, prompting these firms to engage in similar upgrades. These subsequent upgrades will also dissipate the possible rents that the first firm may enjoy, so there is an asymmetry between the costs of failure and the gains of success that the first firm may have. To compensate for the externality and the asymmetry between the possible costs and gains, the government may provide some forms of subsidy, such as tax incentives or loan guarantees, to the firms that initially follow the government's industrial policy.

It is worthwhile to note that there is a fundamental difference between the industrial policy of the CAF strategy and that of the CAD strategy. The promoted industry/technology in the CAF strategy is consistent with the comparative advantage determined by changes in the economy's factor endowments, whereas the priority industry/technology that the CAD strategy attempts to promote is not consistent with comparative advantage. Therefore, the firms in the CAF strategy should be viable, and a small, limited-time subsidy should be enough to compensate for the information externality. By contrast, firms following a CAD strategy are not viable, and their survival depends on large, continuous policy favors/support from the government.[10]

A comparison of the successes and failures of industrial policies on automobile production in PRC, India, Japan, and Korea is a good illustration of the differences between CAF and CAD industrial policies. The automobile industry is a typical capital-intensive heavy industry. The development of an automobile industry is the dream of every developing country. Japan adopted an industrial policy to promote its automobile industry in the mid-1960s and achieved great success. Japan's experience is often cited as a supporting argument by advocates of an industrial policy for heavy industries in developing countries. Korea instituted an industrial policy for automobile production in the mid-1970s. Korea has also achieved a limited degree of success in automobile production. The automobile industries in the PRC and India were started in the 1950s, and the industry in both countries has required continuous protection from the government since that time. What can explain why a similar industrial policy can yield success in one instance and failure in another? This will be clear once we compare the per capita income of these countries with the per capita income of the US at the time when the US initiated its policies (see Table 3).

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[10] Dynamic comparative advantage is an often-used argument for the government's industrial policy and support to the firms (Redding 1999). However, in our framework it can be clearly seen that the argument is valid only if the government's support is limited to overcoming information and coordination costs and the pioneering firms' externality to other firms. The industry should be consistent with the comparative advantage of the economy and the firms in the new industry should be viable, otherwise the firms will collapse once government support is removed.

Table 3. **Level of Per Capita Income (in 1990 Geary Khamis dollars)**

	US	Japan	Korea	India	PRC
1955	10,970	2,695	1,197	665	818
1965	14,017	5,771	1,578	785	945
1975	16,060	10,973	3,475	900	1250

Source: Maddison (1995, 196-205).

Per capita income is a good proxy for the relative abundance of capital and labor in an economy. Capital is abundant and wage rates are high in a high-income country. In a low-income country, the opposite holds true. Table 3 indicates that when Japan initiated its automobile production policy in the mid-1960s, its per capita income was more than 40 percent that of the United States. The automobile industry was not the most advanced, capital-intensive industry at that time nor was Japan a capital-scarce economy. The Ministry of International Trade and Industry (MITI) only gave support to Nissan and Toyota. However, more than 10 firms, ignoring MITI's prompting to not enter the industry, also started automobile production and were successful, even though they did not receive any support from MITI. The above evidence indicates that the Japanese automobile firms were viable, and MITI's promotion of the automobile industry in the 1960s was a CAF strategy. When Korea initiated its automobile industry development policy in the 1970s, its per capita income was only about 20 percent that of the US, and about 30 percent that of Japan. This may explain why the Korean government needed to give its automobile firms much greater and longer support than the Japanese government to their firms. Even despite the support, two of the three automobile firms in Korea recently fell into bankruptcy. When the PRC and India initiated their automobile industry development policies in the 1950s, their per capita incomes were less than 10 percent that of the United States. The automobile firms in the PRC and in India were not viable at all. Even until today, their survival still depends on heavy government protection.[11]

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[11] Most big push attempts by the less developed countries in the 1950s and 1960s failed. However, there is renewed interest in the idea after the influential articles by Murphy, Shleifer, and Vishny (1989). Their papers show that a government's coordination and support

VI. VIABILITY, ECONOMIC REFORM, AND TRANSITION

Empirical evidence shows that adoption of a CAD strategy is detrimental to growth, macro stability, and income distribution in a developing county (Lin 2003, Lin and Liu 2002, Lin and Liu 2004). However, the CAD strategy with its resulting government interventions is good at mobilizing scarce resources initially for investment in a few clear, well-defined priority sectors (Ericson 1991). The countries that adopt the CAD strategy can also enjoy a period of investment-led growth so long as it is possible to mobilize resources administratively from domestic or international sources for investing in the priority sectors. Therefore, because of the lack of knowledge about the long-term consequences of the CAD strategy, the aspiration for quick nation building, or the concern for immediate performance during their tenure in offices, the CAD strategy was attractive to political leaders in the LDCs and had been adopted by almost all governments in the LDCs after World War II (Chenery 1961). However, once financial resources from domestic and international sources were depleted, the economy stagnated and the inherited problems of the CAD strategy started to appear.[12] The economy would encounter all kinds of difficulties, and voluntarily or involuntarily market-oriented reforms have become an unavoidable choice in the LDCs, socialist and nonsocialist alike, since the late 1970s (Krueger 1992).

When the reforms started, most LDCs focused their attention on the distortions and government interventions and attempted to establish institutions considered essential for markets to function efficiently (Williamson 1997, Kolodko 2001). However, except for PRC, Viet Nam, and a few other countries, the growth performance of socialist economies in transition is miserable. The disappointing performance of transition economies in the former Soviet Union

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are required for setting up a key industry and that the demand spillovers from the key industry to other industries will enhance economic growth. However, for the "big push" strategy to be successful the pushed industry must be consistent with comparative advantage, which is determined by the relative factor endowment of the economy, and the firms in the pushed industry must be viable after the push. Deviation from comparative advantage in the pushed industries and the consequent lack of viability of the chosen firms are the reasons why so many big-push attempts by the less developed countries in the 1950s and 1960s failed.

[12] How long the CAD strategy can be sustained in a country depends on how rich the natural resources per capita in the country are (Ranis and Syed 1992). In addition, the period may also depend on the size of population in a country. In the early 1950s, East Asian economies such as Korea; Singapore; and Taipei,China also followed the CAD strategy. However, due to their poor natural endowments and small populations, their economies immediately encountered huge fiscal deficits, high inflation, and external imbalances. Therefore, they were forced to give up the CAD strategy. Due to their governments' inability to subsidize nonviable firms, the CAF became the *de facto* strategy. This may explain the successful development experiences of these economies.

and Eastern Europe (FSUEE) is especially striking. When transition started in the FSUEE in the late 1980s and early 1990s, most economists were optimistic about their expected outcomes due to the fact that these countries adopted a shock therapy,[13] which attempted to restore market institutions as soon as possible. Ten years after the transition started, contrary to early optimism, the countries experienced a prolonged period of rampant inflation, output collapse, sharp widening of inequality, and worsening of other social indicators (World Bank 2002, Blejer and Skreb 2001, Roland 2000). The cumulative output declines were much more serious in all countries in the Commonwealth of Independent States and in most countries in Central and Southern Europe and the Baltics than the decline in the US during the Great Depression (World Bank 2002).

Not only was the performance from transition to market economy in the FSUEE disappointing but also in other developing countries. The poor performance is puzzling because, as the study of Easterly (2001) shows, variables that are considered important in the growth regressions—such as financial deepening, trade and exchange rate liberalization, health, education, fertility, and infrastructure—generally improved compared to the situation before the transition/reform in 1960–1979. Easterly speculates that worldwide factors like the increase in world interest rates, the increased debt burden of developing countries, the growth slowdown in the industrial world, and the skill-biased technological change contribute to the developing countries' stagnation in the last decades of the 1980s and the 1990s. However, Easterly's hypothesis is not consistent with the PRC's remarkable annual GDP growth rate of 9.6 percent in 1980–2000 and Viet Nam's 6.5 percent in 1985–2000.

As argued in Section III, many distortions and government regulations in the socialist economies and developing countries, which are considered detrimental to economic performance from the viewpoint of neoclassical economics, are in fact endogenous to the viability problem of firms in the priority sectors of the CAD strategy previously adopted by the governments. Since neoclassical economics implicitly assumes that all firms existing in the market are viable, the reform advice, based on neoclassical economics and capsulized in the Washington Consensus, attempts to get rid of the distortions and interventions directly (Lin 2005). However, without first appropriately addressing the viability problem of firms in the priority sectors during the transition, eliminating or liberalizing those endogenous distortions or regulations may result in changing institutions from second-best to third-best, causing economic performance to deteriorate after the reform/transition. This is because if all the distortions and regulations are removed, the viability problems of firms in the priority sectors will turn from implicit to explicit. Those nonviable firms will immediately become bankrupt if they do not receive any subsidy or protection.

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[13] The key elements of shock therapy include price liberalization, privatization, and macro-stabilization.

If the number of nonviable firms and the number of workers employed are both small and the political determination for giving up the CAD strategy is strong, a shock therapy can succeed. The elimination of distortions and protections may cause the few firms to fall into bankruptcy but the viable firms in the previously depressed sectors may grow rapidly after the liberalization, and overcompensate for the loss of output and employment from the bankruptcy of the nonviable firms.[14] However, if the number of nonviable firms and the number of workers employed are large, a forceful elimination of those distortions and protections will lead to widespread unemployment, resulting in economic collapse instead of recovery, such as what happened in the FSUEE and recently Indonesia. Social and political stability would be difficult to maintain. To prevent the dreadful consequences, after the initial attempt of forceful implementation of the reforms, the government often finds other ways to subsidize or protect the nonviable firms, resulting in half-done reform and a worse economic performance than that in the prereform situation. The failure of some countries in the FSUEE is such an example and deserves further analysis.

Most developing countries begin with a large number of nonviable firms, set up under the previous CAD strategy, when they embark on reforms. The direct implementation of many policy reforms based on existing neoclassical economics, which implicitly assumes that firms are viable, may not be appropriate. There is a need to find a way to revive economic dynamism while solving the viability issue of firms in the priority sectors and allowing the economy to gradually move toward a well-functioning market system. The PRC's experience may provide a useful example for other economies in the transition processes or those about to start their transition.

The PRC started its transition in 1979 with a piecemeal, gradual, dual-track approach. At the beginning of reforms, the PRC government gave partial autonomy to managers of state-owned enterprises (SOEs) and decollectivized the farms to improve incentives. However, the government still provided protection and support to nonviable SOEs in the traditional sectors to buffer them from the threat of bankruptcy. This incentive improvement resulted in productivity increase in both agriculture and industrial sectors (Lau et al. 2000, Lin 1992, Li 1997, Groves et al. 1994, World Bank 1992). At the same time, the government relaxed its strict control on entry, consistent with the PRC's comparative advantages, and which was depressed under the previous CAD strategy. This resulted in the rapid growth of labor-intensive, small- and medium-size, nonstate-owned firms such as township and village enterprises (TVEs), joint venture firms, and private enterprises. The rapid development of TVEs is illustrative. From 1978 to 1996, the number of TVEs increased from 1.52 million to 23.36 million; and the number of workers hired increased from 28.27 million to 135.08 million, or in terms of percentage of total rural labor force, an increase from 9.5 to 29.8 percent. Equally remarkably, TVEs have become one of the major forces behind the PRC's overall sustained growth. The industrial output value of the TVEs increased from 9.1 percent of the national total in 1978 to 57.9 percent in 1997. Rural industry is no longer merely a supplement to agricultural production, but has become an indispensable source of growth nationwide. It is widely acknowledged that export has been one of the leading factors contributing to the PRC's recent success; the TVEs' share of exports in total exports increased from 9.2 percent in 1986 to 45.8 percent in 1997 (Lin and Yao 2001).

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[14] Bolivia is such a case for the Washington Consensus. It was a small economy with only a 5.6 million population in 1980. The number of nonviable firms that government could support was small. Therefore, the shock therapy recommended by Jeffrey Sachs was successful.

Viet Nam is another country that has achieved dynamic growth after transition. As in the PRC, Viet Nam started transition with the decollectivization of agriculture, enlargement of SOE autonomy, and promotion of small- and medium-size nonstate enterprises in sectors that were previously repressed in the planned economy. State-owned enterprises maintained their dominant role in the industrial sector.[15] Through this cautious and gradual approach, the average annual GDP growth rate in Viet Nam reached 6.5 percent in 1985–2000.

In FSUEE after the initial transition recession, recovery also came mainly from the entry of small- and medium-size enterprises into the previously repressed labor-intensive sectors. In 1998 new small enterprises, which employed fewer than 50 workers, contributed about 50 percent of employment in the leading reformers such as Czech Republic, Hungary, Latvia, Lithuania, and Poland, whereas in the poor performing countries, such as Belarus, Kazakhstan, Russia, and Ukraine, the employment share of small enterprises was only between 10 and 20 percent (World Bank 2002, 39).

The entry of small- and medium-size firms to the repressed sectors in a CAD strategy allowed the PRC and a few other economies to enjoy dynamic growth in the transition process. However, a country's completion of transition and reform to a market economy will not be complete until the viability issue of firms in the priority sectors of the CAD strategy is solved. Otherwise the government needs to maintain its intervention in markets in order to protect/subsidize the nonviable firms and prevent the inevitable distortions such actions will entail. For example, along with the rapid economic growth in the PRC's transition, the share of nonperforming loans looms large and corruption is widespread (Lardy 1998). These problems have their roots in the viability problem of SOEs. After 1983, the approach adopted by the PRC government to support the SOEs changed from direct fiscal appropriation to offering low interest-rate loans from state-owned commercial banks. Currently, over 70 percent of bank loans are lent to the SOEs, but due to their poor performance, many SOEs have been unable to repay the loans. Therefore, the banks accumulate large amounts of nonperforming loans. To support the SOEs, the government also limits market entry into certain sectors so that the SOEs can enjoy monopolistic rents. Many SOEs (and non-SOEs) seek rents from the government to acquire more low-interest loans or licenses for market entry to those regulated sectors, thus adding fuel to the widespread corruption.

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[15] In fact, in Viet Nam the GDP share of SOEs increased from 33 percent in 1989 to 39 percent in 1996 (Sun 1997).

The effective approach to resolve the viability issue of existing SOEs may be different from one country to another. For the case of the PRC, my coauthors and I recommend four measures, depending on the nature of the SOEs' outputs (Lin, Cai, and Zhou 1997 and 1998). First, if the SOE's output is essential for national defense, the government is required to use fiscal appropriation continuously to support the operations of the firm. Second, if the SOE's output has a large domestic market, the SOE can get access to internal capital by either forming a joint venture with multinational companies or listing in international equity markets. Third, if the SOE's output does not have a large domestic market but the SOE has good engineer and management capacity, the SOE can rely on its strength in human capital and shift to producing those types of products that are consistent with the PRC's comparative advantage and which have a large domestic market. Fourth, if the SOE's output does not have a large domestic market and the SOE does not have engineer and managerial strength either, the SOE should be allowed to go bankrupt. As long as the economy can maintain dynamic growth, the economy should be able to create enough jobs to absorb workers released from the bankrupted firms and enough resources to compensate for losers in the transition process.

Only after the problems of viability are solved, whether or not an SOE can earn acceptable profit in a competitive market becomes the manager's own business.[16] The government will no longer need to find ways to intervene in the markets in order to protect or subsidize the firms. Only then can the elimination of distortions and government interventions, as stipulated in the Washington Consensus, be carried out wholeheartedly and successfully. However, whether the government will follow the required policy reforms for a well-functioning market system also depends on whether the government has the wisdom and determination to give up the CAD strategy and switch to the CAF strategy.[17]

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[16] In the case of the PRC, the SOEs have another burden, which I call the social burden, comprising redundant workers and pension for retired workers. The PRC government was responsible for providing jobs to urban residents. However, in spite of large investments each year, the CAD strategy could not create enough jobs for the urban residents. To solve the employment problem, the government assigned several workers for one position at the SOEs. Before the reforms, redundant workers were not a burden on the SOEs because the SOEs submitted all revenues to the state and the state covered all SOE expenditures, including wage bills, by fiscal appropriation. After the reforms, the SOEs stopped submitting their revenues to the state and had to pay their own wage bills. Therefore, the redundant workers become a burden on the SOEs. Similarly, before the reforms, the government paid low wages to SOE workers and provided old-age pensions directly by the fiscal appropriation. After the reforms, the responsibility of providing old-age pension switched to SOEs. Therefore, the older the SOEs, the heavier the pension burden became. If the SOEs' social burden is not eliminated, the

VII. CONCLUDING REMARKS

In this lecture, I argue that many development efforts in the developing countries after World War II failed because of their political leaders' failure to understand the endogeneity nature of industry/technology structure in an economy and their adoption of a CAD strategy to build up modern capital-intensive sectors on the basis of their capital-scarce endowment structure. For carrying out such a strategy, the government introduced various interventions and distortions to protect and subsidize the nonviable firms in the government's priority sectors. I also argue that the reforms and transitions in the 1980s and 1990s in many socialist and nonsocialist developing countries failed to set their economies on a new dynamic growth path because their reformers, based on the teaching of existing neoclassical economics, which assumes all firms existing in the market are viable (Lin 2004), failed to understand that many interventions and distortions are endogenous to the needs of protected nonviable firms in the priority sectors of the previous development strategy. The countries in developing Asia could benefit from the "advantage of backwardness" and achieve dynamic, inclusive growth if their governments could find ways to address their existing firms' viability issue properly, successfully switch to an alternative CAF strategy, and adopt required institutions accordingly.

In this lecture I only focused on the issues related to the government's development strategy on technology and industry. Currently 63 percent of the population in developing Asia still lives in rural areas and 54 percent still relies on agriculture for living. If the countries in developing Asia successfully switch to

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government will be required to give SOEs protection or subsidies. The social burden will become a source of SOEs' soft budget constraints. The PRC government now adopts a policy, called *xiagang*, allowing SOEs to lay off their redundant workers and helping the laid-off workers with training and reemployment. The government also set up a social pension system to resolve the SOEs' burden of old-age pension.

[17] The traditional heavy industries may not be attractive to the developing countries anymore. However, in many societies the obsession for heavy industries has been replaced by the information technology, biotechnology, and other high-tech industries. If a developing country's government wants to accelerate the growth of these new industries in its economy, firms in these industries will be nonviable and would require government subsidies and protection as is the case in the traditional CAD strategy. The institutional reforms toward a well-functioning market economy cannot be completed successfully.

the CAF strategy, it is expected that agricultural employment will decline quickly and urbanization will proceed rapidly. The governments should have an appropriate education strategy for the rural population in order to increase their ability to cope with the challenges of nonagricultural jobs and urban living. The governments should also invest in agricultural technology and rural infrastructure in order to help those people still staying on in the rural agricultural sectors. The governments also need to cultivate an environment that encourages indigenous innovations in various social, economic, and political institutions in order to facilitate their countries' transition from traditional agriculture to modern industrial societies. With the joint efforts of governments, people from all walks of life, and the international community, developing Asia will have a new era of dynamic, inclusive growth.

REFERENCES

Acemoglu, D., 2002. Why Not a Political Coase Theorem? Social Conflict, Commitment and Politics. NBER Working Paper No. 9377, National Bureau of Economic Research, Massachusetts.

Acemoglu, D., and J. A. Robinson, 2002. Economic Backwardness in Political Perspective. NBER Working Paper No. 8831, National Bureau of Economic Research, Massachusetts.

Acemoglu, D., S. Johnson, and J. A. Robinson, 2001a. "The Colonial Origins of Comparative Development: An Empirical Investigation." *American Economic Review* 91(5):1369-401.

———, 2001b. Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution. NBER Working Paper No. 8460, National Bureau of Economic Research, Massachusetts.

Asian Development Bank, 1999. "The Financial Crisis in Asia." In *Asian Development Outlook 1999*. Asian Development Bank, Manila.

———, 2004. "Poverty in Asia: Measurement, Estimates, and Prospects." In *Key Indicators 2004*. Asian Development Bank, Manila.

Blejer, M. I., and M. Skreb, eds., 2001. *Transition: the First Decade*. Cambridge, MA: MIT Press.

Caselli, F., and W. J. Coleman II, 2002. "On the Theory of Ethnic Conflict." Harvard University. Processed.

Chenery, H. B. 1961. "Comparative Advantage and Development Policy." *American Economic Review* 51(1):18-51.

Dewatripont, M., and E. Maskin, 1995. "Credit and Efficiency in Centralized and Decentralized Economies." *Review of Economic Studies* 62(4):541-56.

Djankov, S., E. Glaeser, R. La Porta, F. Lopez-de-Silanes, and A. Shleifer, 2002. "Regulation of Entry." *Quarterly Journal of Economics* 117(1):1-37.

———, 2003. "The New Comparative Economics." *Journal of Comparative Economics* 31 (4): 595-619.

Easterly, W., 2001. "The Lost Decades: Developing Countries' Stagnation in Spite of Policy Reform 1980-1998." *Journal of Economic Growth* 6 (2):135-57.

Engerman, S., and K. Sokoloff, 1997. "Factor Endowments, Institutions, and Differential Paths of Growth Among New World Economics: A View from Economic Historians of the

United States." In S. Haber, ed., *How Latin America Fell Behind: Essays on the Economic Histories of Brazil and Mexico 1800-1914*. Stanford: Stanford University Press.

Ericson, R. E., 1991. "The Classical Soviet-type Economy: Nature of the System and Implications for Reform." *Journal of Economic Perspectives* 5(4, Fall):11-27.

FAO (Food and Agriculture Organization of the United Nations), 2004. *FAO Statistical Database*. Available: http://faostat.fao.org/?language=EN.

Fei, J., G. Ranis, and S. W. Y. Kuo, 1979. *Growth with Equity: The Taiwan Case*. New York: Oxford University Press.

Grossman, G. M., and E. Helpman, 1994. "Endogenous Innovation in the Theory of Growth." *Journal of Economic Perspectives* 8(Winter):23-44.

Groves, T., Y. M. Hong, J. McMillan, and B. Naughton, 1994. "Autonomy and Incentives in Chinese State Enterprises." *Quarterly Journal of Economics* 109(1, February):183-209.

Hasan, R., and M. G. Quibria, 2004. "Industry Matters for Poverty: A Critique of Agricultural Fundamentalism" *Kyklos* 57(2):253-64.

Hayami, Y., 1997. *Development Economics: From the Poverty to the Wealth of Nations*. New York: Oxford University Press.

Kolodko, G. W., 2001. "Postcommunist Transition and Post-Washington Consensus: The Lessons for Policy Reforms." In M. I. Blejer and M. Skreb, eds., *Transition: The First Decade*. Cambridge, MA: MIT Press.

Kornai, J., 1986. "The Soft Budget Constraint." *Kyklos* 39(1):3-30.

Krueger, A. O., 1992. *Economic Policy Reform in Developing Countries*. Oxford: Basil Blackwell.

Kuznets, S., 1966. *Modern Economic Growth: Rate, Structure, and Spread*. New Haven: Yale University Press.

La Porta, R., F. Lopez-di-Silanes, A. Shleifer, and R. Vishny, 1998. "Law and Finance." *Journal of Political Economy* 106(December):1113-55.

———, 1999. "The Quality of Government." *Journal of Law, Economics, and Organization* 15(1):222-79.

Lardy, N. R., 1998. *China's Unfinished Economic Revolution*. Washington, DC: Brookings Institution Press.

Lau, L. J., Y. Qian, and R. Gerard, 2000. "Reform without Losers: An Interpretation of China's Dual-Track Approach to Transition." *Journal of Political Economy* 108(1):120-43.

Li, W., 1997. "The Impact of Economic Reform on the Performance of Chinese State Enterprises, 1980-1989." *Journal of Political Economy* 105(5):1080-106.

Lin, J. Y., 1992. "Rural Reforms and Agricultural Growth in China." *American Economic Review* 82(March):34-51.

———, 2000. "The Financial and Economic Crisis in Asia: Causes and Long-term Implications." In *The New Social Policy Agenda in Asia*. Proceedings of the Manila Social Forum, Asian Development Bank, Manila.

———, 2003. "Development Strategy, Viability and Economic Convergence." *Economic Development and Cultural Change* 53(2):277-308.

———, 2005. "Viability, Economic Transition and Reflection of Neoclassical Economics." *Kyklos* 58 (2): 239-64.

Lin, J. Y., and P. Liu, 2002. Development Strategy, Equity and Efficiency. CCER Working Paper Series, No. C2002007, China Center for Economic Research, Peking University, Beijing.

Lin, J. Y., and M. X. Liu, 2004. "Development Strategy, Transition and Challenges of Development in Lagging Regions." In F. Bourguignon and B. Pleskovic, eds., *Annual World Bank Conference on Development Economics 2004: Accelerating Development (Bangalore Conference Proceedings)*. World Bank, Washington, DC.

Lin, J. Y., and G. Tan, 1999. "Policy Burdens, Accountability, and the Soft Budget Constraint." *American Economic Review: Papers and Proceedings* 89(2, May):426-31.

Lin, J. Y., and Y. Yao, 2001. "Chinese Rural Industrialization in the Context of the East Asian Miracle." In J. E. Stigilitz and S. Yusuf, eds., *Rethinking the East Asian Miracle*. Oxford and New York: Oxford University Press.

Lin, J. Y., C. Fang, and L. Zhou, 1994. *China's Miracle: Development Strategy and Economic Reform* (in Chinese). Shanghai: Shanghai Sanlian Press; 1996, Chinese University of Hong Kong Press (in English, 1st ed.) and 2003 (in English, 2nd ed.).

———, 1997. *Sufficient Information and SOE Reform* (in Chinese). Shanghai: Shanghai Sanlian Press; *State-owned Enterprise Reform in China* (in English, 2001). Hong Kong: Chinese University Press.

———, 1998. "Competition, Policy Burdens, and State-owned Enterprise Reform." *American Economic Review: Papers and Proceedings* 88(2):422-27.

Lucas, R. E. 1988. "On the Mechanism of Economic Development." *Journal of Monetary Economics* 22(March):3-42.

Maddison, A., 1995. *Monitoring the World Economy, 1820-1992*. Organisation for Economic Co-operation and Development, Paris.

———, 2001. *The World Economy: A Millennial Perspective*. Organisation for Economic Co-operation and Development, Paris.

McKinnon, R. I., 1973. *Money and Capital in Economic Development*. Brookings Institution, Washington, DC.

Murphy, K. M., A. Shleifer, and R. W. Vishny, 1989. "Industrialization and Big Push." *Journal of Political Economy* 97(October):1003-26.

Pack, H., 1994. "Endogenous Growth Theory: Intellectual Appeal and Empirical Shortcomings." *Journal of Economic Perspectives* 8(Winter):55-72.

Pearson, R. et al., 1969. *Partners in Development: Report of the Commission on International Development*. New York: Praeger.

Pigou, A. C., 1938. *The Economics of Welfare*. 4th ed. London: Macmillan and Co.

Ranis, G., and M. Syed, 1992. *The Political Economy of Development Policy Change*. Cambridge, MA: Blackwell.

Redding, S., 1999. "Dynamic Comparative Advantage and the Welfare Effects of Trade." *Oxford Economic Papers* 51(January):15-39.

Rodrik, D., 1996. "Understanding Economic Policy Reform." *Journal of Economic Literature* (March):9-41.

———, 1998. Where Did All the Growth Go? External Shocks, Social Conflict, and Growth Collapse. Working Paper Series, No. 6330, National Bureau of Economic Research, Cambridge, Massachusetts.

———, 2003. "Institution, Integration, and Geography: In Search of the Deep Determinants of Economic Growth." In D. Rodrick, ed., *In Search of Prosperity: Analytic Country Studies on Growth*. Princeton, NJ: Princeton University Press.

Roland, G., 2000. *Transition and Economics: Politics, Markets, and Firms*. Cambridge, MA: MIT Press.

Romer, P., 1986. "Increasing Returns and Long-run Growth." *Journal of Political Economy* 94(5):1002-37.

———, 1994. "The Origins of Endogenous Growth." *Journal of Economic Perspectives* 5(Winter):3-22.

Shaw, E. S., 1969. *Financial Deepening in Economic Development.* New York: Oxford University Press.

Shleifer, A., and R. Vishny, 1993. "Corruption." *Quarterly Journal of Economics* 108:599-617.

———, 1998. *The Grabbing Hand: Government Pathologies and their Cures.* Cambridge, MA: Harvard University Press.

Solow, R. M., 1956. "A Contribution to the Theory of Economic Growth." *Quarterly Journal of Economics* 70(February):65-94.

Sun, L. X., 1997. *Emergence of Unorthodox Ownership and Governance Structure in East Asia: An Alternative Transition Path.* UNU/WIDER, Helsinki.

Williamson, J., 1997. "The Washington Consensus Revisited." In L. Emmerij, ed., *Economic and Social Development into the XXI Century.* Inter-American Development Bank, Washington, DC.

World Bank, 1992. *Reform and the Role of Planning in the 1990s.* World Bank, Washington, DC.

———, 2002a. "Global Development Network Growth Database." Available: http://www.worldbank.org/research/growth/GDNdata.htm.

———, 2002b. *World Bank, Transition: The First Ten Years, Analysis and Lessons for for Eastern Europe and the Former Soviet Union.* World Bank, Washington, DC.

Trade and Workers: Evidence from the Philippines

RANA HASAN AND LAN CHEN

This paper combines labor force survey data with trade and production data from 1988 to 1997 to examine the impact of trade on wages and employment in the Philippines's manufacturing sector. In contrast to findings typically reported for Latin American countries, data indicate that wage inequality in the manufacturing sector declined over a period in which trade liberalization was undertaken. This was despite the fact that reductions in tariff rates were largest in less skill-intensive manufacturing industries. There was also an absence of any secular rise in returns to higher education. Tariff reductions were associated with declines in industry wage premiums in capital-intensive industries. Moreover, these declines were largest for skilled workers. Tariff reductions have had an insignificant effect on both employment as well as average hours of work of full-time employees across industries. These findings are consistent with a scenario where workers in capital-intensive industries, especially the more skilled ones, earned rents prior to trade liberalization, which may have eroded these.

I. INTRODUCTION

Over the last two decades, scores of developing countries have moved to liberalize their trade regimes. How have these episodes of liberalization affected workers? In view of the importance of this question for public policy there have been a number of recent papers that examine various dimensions of this issue. Prominent examples include the work of Currie and Harrison (1997), Ravenga (1997), Hanson and Harrison (1999), Robbins and Gindling (1999), Feliciano (2001), and Goldberg and Pavcnik (2001). By and large, much of this work has been based on the experience of various Latin American countries, with a few contributions considering cases from Africa. Recent evidence from liberalizing

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Asian countries is much more limited.[1] This gap in the regional coverage of the existing literature is particularly glaring given Asia's abundance of labor (in both absolute as well as relative terms). This paper takes some steps toward filling this gap by analyzing trade–labor linkages in the Philippines, a country that has embarked on a program of trade liberalization since the mid-1980s and for which fairly good data are available.

This paper examines the impact of trade on relative industry wages and employment in the manufacturing sector from 1988 to 1997. As in the work of Gaston and Trefler (1994) for the United States (US) and Feliciano (2001) and Goldberg and Pavcnik (2001) mentioned above, industry wage premiums are estimated using labor force survey data. These are subsequently related to measures of trade policy, trade flows, and industry characteristics. Since the wage premiums are based on earnings functions that include controls for various observable worker characteristics including age, sex, and educational attainment, they represent the portion of wages that are purged of workers' observable characteristics and accrue to workers' industry of employment. Working with industry wage premiums can therefore alleviate aggregation biases that may result from working with average industry- or plant-level wages. For example, suppose that import-competing industries employ a larger share of skilled and thus higher paid workers, as is the case for the Philippines. Import-competing industries would then have higher average wages. Ignoring the composition of worker characteristics across industries may lead a researcher to take the positive correlation between imports and average wages as evidence that import competition is beneficial for wages (working through the effect of import competition on innovation and productivity, for instance).

The panel nature of the study's estimated industry wage premiums and access to production data at the industry level allows for addressing another potential complication in estimating the impact of trade on relative wages. As Gaston and Trefler (1994) point out, policymakers may set trade policy considering the composition of workers across industries (for example, average education, average age, average level of skills, etc.). Since worker composition may also affect wage premiums—US data suggest that industries with larger shares of skilled workers tend to have higher wage premiums, something also found with the Philippines data—ignoring the endogeneity of protection will lead ordinary least squares (OLS) estimates of the impact of protection on wage premiums to be inconsistent. To alleviate endogeneity concerns, industry characteristics are controlled in estimation. Since the data contain very limited information on pertinent industry characteristics—only capital–labor ratios across industries are available—the paper makes intensive use of industry fixed effects in estimation. The latter can make up for the limited data on industry characteristics. For example, information on unionization is not available by manufacturing industry. If unionization varies across industries and has important effects on how labor markets adjust to trade liberalization—as Gaston and Trefler (1995) find to be the case for the US—the analysis would miss out on these effects. To the extent that unionization and the structure of bargaining between workers and firms is slow to change, introducing industry fixed effects can be useful for alleviating omitted variable bias.

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[1] Exceptions include the work of Suryahadi (1999 and 2003) for Indonesia; and Kambhapati, Krishna, and Mitra (1997) for India. The former examines the links between trade and premium to skills/education while the latter focus on the effects of liberalization on employment in five import-competing industries.

The paper also examines other dimensions of trade–labor linkages. Much of the recent work on trade and wages has focused on the effects of trade on economywide returns to education. While an analysis of the role of trade in driving changes in returns to education is beyond the scope of this paper (Chu, Hasan, and Lee 2002 focus on this issue), the earnings function estimates shed light on the behavior of returns to education over the period of trade reform in the Philippines. Finally, available industry-level information on employment as well as average hours worked assess how trade has impacted employment in terms of both employee counts as well as hours of work across manufacturing industries.

The remainder of the paper is organized as follows. Section II discusses some conceptual issues related to trade and labor market linkages and also provides a description of the trade policy framework in the Philippines. Section III describes the data and presents summary statistics and trends pertaining to trade and relevant worker characteristics. Section IV describes the results and Section V concludes.

II. TRADE AND LABOR LINKAGES

A. Conceptual Issues

One of the most convenient starting points for thinking about trade and labor linkages is the Heckscher-Ohlin (HO) model of trade. In its simplest version, where trade takes place between two countries of the world endowed with two factors of production in different proportions, the model predicts that a reduction in trade barriers will raise the demand for and returns to the abundant factor in each of the two regions. If the two factors are skilled and unskilled labor, trade liberalization in the unskilled abundant country should lead to a decrease in wage inequality between skilled and unskilled labor as the demand for unskilled workers increases. The opposite should take place in the skill-abundant country.

The HO model's assumption of perfect factor mobility implies that returns to factors are equal across sectors. Since in reality factors may take considerable time to reallocate across sectors, the HO model is often thought to describe the long-run effects of trade. For the short to medium run, a better guide to the labor market effects of trade may be provided by the specific factors model. For example, trade liberalization focused on one sector will depress wages in that sector if labor is immobile. This happens as increased imports in the liberalized sector shift the industry demand for labor downward. The inability of workers to move to other sectors breaks the link between their wages and those elsewhere. As Goldberg and Pavcnik (2001) point out, the widely held belief that trade hurts workers is consistent with the specific factors model.

Allowing for imperfections in product and factor markets introduces a far richer variety of possibilities than the general equilibrium HO and specific factors models allow, however. If domestic firms have monopoly power, for example, trade liberalization may have a "pro-competitive effect" on workers as import competition makes the product demand curve more elastic and forces firms to reduce markups. Under certain conditions, the reduction in markups will lead to an increase in the demand for labor, a proposition for which Kambhapati, Krishna, and Mitra (1997) present evidence using plant-level data for five import-competing industries from India. Firms may also react to import competition by investing in improvements in productivity. The latter would raise the demand for labor, ceteris paribus. Currie and Harrison (1997) find evidence that firms in some sectors in Morocco did respond to trade liberalization in this manner.

How changes in labor demand impact workers depends also on the nature of competition in labor markets. When they are competitive, industry elasticities of labor demand and supply determine the extent of movement in employment and wages. On the other hand, labor market imperfections introduce yet another layer of complexity. When workers have bargaining power, for example, it is quite likely that they will use this to share in the rents created by protection.[2] Trade liberalization may then be expected to especially hurt workers in those industries where they have bargaining power as rents decline. But the actual responses will depend on specific circumstances. Workers with bargaining power may choose to maintain employment and accept lower wages. But the opposite may also take place as when lay-off rules benefit senior workers so that senior workers push for higher wages at the expense of unemployment of junior workers (Grossman 1984).

As the foregoing discussion indicates, there are a number of factors that influence trade–labor linkages. Empirical evidence is ultimately needed to determine which channels are, or at least appear to be, the more relevant ones.

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[2] As is explained later, data on unionization is not available by two digit industries. Capital intensity of an industry is used as a proxy for bargaining power. For a variety of reasons it is likely that workers are better organized in capital-intensive industries. See Section IVB for more details.

B. Trade Liberalization in the Philippines[3]

Like many other developing countries, the Philippines pursued protectionist policies from the 1950s to the 1970s. Although there were some attempts at liberalizing trade in the 1960s and 1970s, it was only in the early 1980s that a serious effort at liberalization was initiated. Two key aspects of the liberalization package were a Tariff Reform Program (TRP) that entailed compression of the tariff rate structure from a 0–100 percent range to a 10–50 percent range from 1981 to 1985, and an Import Liberalization Program (ILP) for lifting quantitative restrictions on imports. The latter was abandoned, however, in 1983 due to a balance-of-payment crisis. It was resumed when the Aquino government came to power in 1986 where it achieved far more success. While 34 percent of the total number of Philippines Standard Commodity Classification lines was regulated in 1985 (only two percentage points less than that in 1980), this was down to 12 percent by 1988 (Medalla 1990).

In 1991 the government enacted a second tariff reform program (the so-called TRP II) whereby tariff rates would be further compressed to a 10–30 percent range. However, there were a number of exceptions granted so that about 10 percent of commodity lines in 1995 were still subject to tariff rates below 10 percent, or between 30 and 50 percent. There was also a liberalization of quantitative restrictions in 1992 for a variety of imported agricultural and manufacturing goods. In a number of cases, the tariff rates on the liberalized goods were set fairly high with a built-in 5-year phasedown of these tariff rates. The tariffication process saw some reversal, however, with the re-imposition of quantitative restrictions in 1993 on various items, largely concentrated among agricultural goods. The result was that while only 164 commodities were subject to quantitative restriction by the end of 1992, the number had increased to 257 by 1993.

A third wave of trade reforms took place in the mid-1990s (TRP III). Measures included a reduction of tariff rates on a variety of manufacturing items including capital equipment and machinery, textiles, garments, and chemical inputs among others. There was also some reduction of tariffs on "non-sensitive" agricultural goods. Overall, the TRP III was aimed at developing a four-tier tariff schedule: 10 or 3 percent for raw materials and capital equipment depending on whether these were available locally or not; 20 percent for intermediate goods; and 30 percent for finished goods. There was also a liberalization of all import restrictions as a result of the need to comply with WTO commitments; some products were however allowed to have tariff rates above the ceiling of 30 percent.

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[3] This section follows Chu et al. (2002). A detailed discussion of trade policy reforms in the Philippines may be found in Manasan and Querubin (1997).

The result of the various trade liberalization measures has made the Philippines a far more open economy, especially insofar as the manufacturing sector is concerned. Calculations by Manasan and Querubin (1997) and Manasan and Pineda (1999) reveal that effective rates of protection were reduced overall by half (29.4 percent in 1990 versus 14.4 percent in 2000). Even larger declines in protection took place in manufacturing (31 percent in 1990 versus 14.5 percent in 2000). Greater openness is also seen in expanding trade flows. While total exports had grown at an annual average rate of 4 percent in the 1980s, they grew at about 16 percent in 1990–1998. The result of this export boom has been to double the Philippines's export share in world markets from around 0.3 percent in 1985 to 0.6 percent in 1998. Manufacturing has been the main contributor to this export boom (World Bank 2000).

III. DATA AND TRENDS

The analysis of trade–labor linkages makes use of three data sets: trade-related data that allow patterns of protection and trade flows across industries to be quantified; production data that provide us an important industry-specific characteristic, namely the capital–labor ratio; and finally the Philippines Labor Force Survey (LFS) data, which provides information on workers.

The trade-related data consists of a measure of average tariff rates and trade flows (imports and exports) for roughly 28 three-digit ISIC (International Standard Industrial Classification) manufacturing industries and comes from the Trade and Production database developed by Nicita and Olarreaga (2001).[4] The original source of the tariff data is the TRAINS database maintained by the United Nations Conference on Trade and Development (UNCTAD). Because tariffs are reported in terms of the six-digit HS classification, Nicita and Olarreaga use a one-to-one concordance table to arrive at tariff rates in terms of the three-digit ISIC classification.[5] They report the tariff as most-favored-nation simple averages at the 3-digit level of the ISIC. Table 1 reports the average tariff rates for the available years.[6] The table confirms two aspects of the trends in protection described in the previous subsection: the broad-based reduction in protection in manufacturing over the 1990s plus the tendency for tariff rates to increase just after the "tariffication" of quantitative restrictions in 1992.

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[4] While average tariff rates are imperfect measures of protection, they are used here because of the lack of availability of other measures, such as effective rates of protection, at sufficiently high levels of disaggregation.

[5] UNCTAD calculates the simple averages using as the denominator only the actual number of dutiable lines.

[6] One drawback of the tariff data is that tariff rates for 1991 and 1997 are missing. As noted below, industry wage premiums are based on LFS data from 1988, 1991, 1994, and 1997. Thus tariff rates for 1991 and 1997 must be obtained in some way. Using the available tariff information from 1988 to 1998, simple interpolation is used to get tariff estimates for these two years. Interpolation for 1991 should not entail much error. As Table 1 shows, tariff rates between 1990 and 1992 were fairly similar. Moreover, the literature on trade policy in the Philippines does not give any reason to believe that there was a spike in tariff rates between

Table 1. **Average Tariff Rates in the Philippines, 1988–1998**

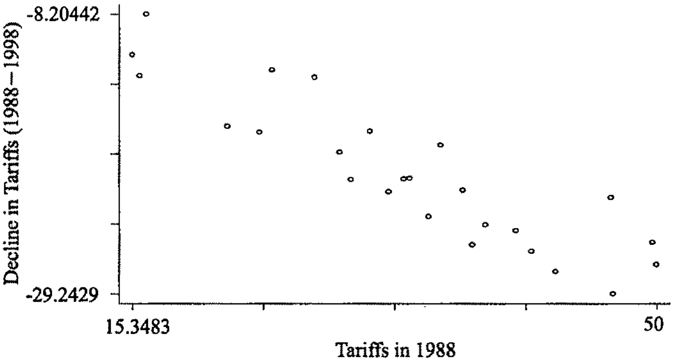
Industry	1988	1989	1990	1992	1993	1994	1995	1998
Food Products	35.74	35.56	25.52	25.54	32.35	30.34	28.37	17.64
Beverages	47.14	47.14	29.05	29.05	43.81	42.14	40.48	17.90
Tobacco	43.33	45.00	27.50	27.50	42.50	42.50	42.50	15.75
Textiles	38.68	38.68	26.07	26.07	29.32	29.29	26.79	14.60
Apparel	49.73	49.73	29.88	29.88	49.16	48.91	30.51	24.34
Leather Products	33.30	33.30	23.26	23.26	32.32	32.21	30.72	12.66
Footwear	47.00	47.00	30.00	30.00	48.00	48.00	48.00	25.00
Wood Products	37.21	37.21	24.89	24.89	27.98	27.77	27.55	15.72
Furniture	50.00	50.00	29.13	29.13	40.00	34.57	29.13	22.96
Paper and Products	32.31	32.39	19.75	19.76	22.73	21.41	19.21	10.73
Printing and Publishing	27.41	27.41	20.00	20.00	22.04	21.02	20.00	14.43
Industrial Chemicals	15.35	15.39	11.73	11.71	11.39	11.36	11.34	4.07
Other Chemicals	23.75	23.70	16.19	16.22	17.96	17.81	17.46	6.64
Petroleum Refineries	15.87	15.87	11.88	11.88	7.78	7.74	7.74	3.00
Miscellaneous Petroleum and Coal Products	20.00	20.00	19.13	19.13	17.88	17.88	17.88	7.25
Rubber Products	29.05	29.15	22.93	22.93	24.23	23.77	23.32	10.43
Plastic Products	41.75	41.75	27.06	27.06	33.66	31.52	29.41	15.68
Pottery, China, Earthenware	40.71	40.71	26.43	26.43	36.07	34.82	33.57	16.21
Glass and Products	34.94	35.27	21.20	21.20	25.92	22.94	20.93	11.50
Other Nonmetallic Mineral Products	33.69	33.69	23.42	23.42	29.60	26.91	27.03	13.13
Iron and Steel	16.29	16.23	14.34	14.34	15.53	15.00	14.88	8.09
Nonferrous Metals	20.63	20.66	16.21	16.21	12.92	12.72	15.29	4.48
Metal Products	31.05	31.01	24.77	24.79	27.18	25.86	25.07	14.01
Nonelectrical Machinery	21.65	21.64	12.97	12.97	13.32	12.97	12.56	4.99
Electrical Machinery	29.81	29.81	19.27	19.31	20.06	18.97	17.93	9.15
Transport Equipment	24.59	24.83	17.68	17.63	17.58	17.22	15.30	12.16
Professional and Scientific Equipment	20.03	20.03	17.09	17.09	16.94	16.90	16.86	7.03
Other Manufactured Products	37.83	38.06	25.59	25.59	30.09	27.41	25.83	12.24

Source: Nicita & Olarreaga (2001).

these years. The situation for 1997 is a little different since tariffs had changed between 1995 and 1998 and interpolation may not capture the actual year-by-year changes well. However, that actual tariff rates declined between 1994 and 1997 for the more aggregated industry groups reported in Manasan and Querubin, and that tariff rates for 1994 (actual) and 1997 (interpolated) are qualitatively similar, provide confidence.

Interestingly, the data also indicate a tendency for protection to be higher in industries generally thought to be more labor-intensive, a pattern similar to that found in a number of other developing countries (Harrison and Hanson 1999). Thus in 1988 tariff rates in industries such as electrical and nonelectrical machinery, transportation equipment, and chemicals were often more than 20 percentage points lower than those in industries such as apparel and footwear. Given this initial pattern of protection, the move to harmonize tariff rates at lower levels meant that previously protected labor-intensive industries saw large declines in protection (Figure 1). At the same time, while absolute differences in tariff rates across industries came down by 1998, the relative structure of protection appears not to have changed dramatically so that relatively protected sectors in 1988 tended to remain protected in 1998 (Figure 2).[7]

Figure 1. **Tariff Rates in 1988 and the Reduction in Tariff Rates between 1988 and 1998**



Trade flow data is also used in the analysis.[8] Table 2 describes three statistics based on trade flow data by industry for the two end-points of the period under analysis: exports as a share of total exports, imports as a share of total imports, and finally net exports as a proportion of total industry trade, or the net trade ratio, $([X_i - M_i] / [X_i + M_i])$.[9] The pattern of net trade ratios tends to conform to expectations: industries generally considered to be labor-intensive are the ones with relatively high values of net trade ratio (for example, apparel and footwear). However, the comparison of export and import shares over time also shows that there has been a remarkable expansion of trade in nontraditional exports. Thus, while apparel—the industry with the highest net trade ratio—had a virtually unchanged export share in 1988 and 1997, electrical machinery—an industry with a negative net trade ratio—has seen a larger than four-fold increase in its export share over time so that by 1997 almost half of all manufacturing exports were accounted for by this industry.[10]

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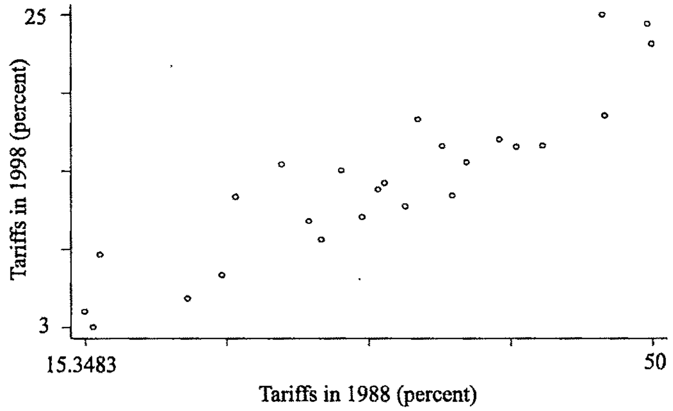
[7] Spearman correlations between tariff rates in 1988 and 1998 were as high as 0.91.

[8] The trade flow data reported by Nicita and Olarreaga are based on the COMTRADE database. Because the COMTRADE data are presented in terms of the SITC rev. 2 classification, Nicita and Olarreaga use concordance filters developed by the OECD to convert them into ISIC classification.

[9] When a group of products is imported but not exported, the value of the net trade ratio is -1. On the other hand, when a group of products is exported but not imported, the net trade ratio is 1.

Figure 2. **Tariff Rates, 1988 and 1998**



The production-related variables contained in Nicita and Olarreaga (2001) are drawn from UNIDO's *International Yearbook of Industrial Statistics* and include at the 3-digit ISIC level, total output, total employment, and gross fixed capital formation. Data on output are used in conjunction with trade data to compute export and import ratios while the gross fixed capital series are used to construct measures of the capital stock in each industry.[11] Dividing capital stocks by total employees gives a measure of the capital intensity of each industry, a variable used in the analysis below.

The LFS data cover four years: 1988, 1991, 1994, and 1997. The data provide demographic and work ("job" or "business") related details including age, gender, highest grade achieved, salary/wages and net receipts from employment, and hours worked.[12] The reference period of work-related information is the quarter from July 1 to September 30 and is available for a respondent's "primary" job as well as a "secondary" job if applicable.

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[10] The rapid increase in these exports can be traced to an increase in investments by multinational corporations in the sector, especially semiconductors, and the rapid increase in world trade in this sector (World Bank 2000).

[11] First, the capital formation series is expressed in 1997 US dollars. Then the current year plus four previous years' real investment expenditures are summed to arrive at a measure of capital stock. A 10 percent depreciation is allowed in the capital stock each year.

[12] While the LFS is a quarterly survey, only the survey for the third quarter asks information on wages. The sample size of these LFS surveys is quite large and can cover about 100,000 individuals per year.

Table 2. **Net Trade and Export and Import Shares**

	1988			**1997**		
Industry	**Net Trade Ratio**	**Share of Total Export**	**Share of Total Import**	**Net Trade Ratio**	**Share of Total Export**	**Share of Total Import**
Food	0.25	0.25	0.10	-0.09	0.06	0.05
Beverage	-0.76	0.00	0.01	-0.76	0.00	0.00
Tobacco	-0.55	0.01	0.01	-0.63	0.00	0.00
Textiles	-0.25	0.06	0.07	-0.27	0.03	0.04
Apparel	0.97	0.07	0.00	0.93	0.08	0.00
Leather	0.20	0.01	0.00	0.30	0.01	0.00
Footwear	0.82	0.01	0.00	0.51	0.01	0.00
Wood Products	0.98	0.12	0.00	0.17	0.01	0.01
Furniture	0.98	0.03	0.00	0.65	0.01	0.00
Paper and Products	-0.76	0.01	0.03	-0.69	0.00	0.01
Printing and Publishing	-0.94	0.00	0.01	-0.87	0.00	0.00
Industrial Chemicals	-0.62	0.06	0.18	-0.79	0.01	0.07
Other Chemicals	-0.77	0.01	0.05	-0.74	0.01	0.03
Petroleum Refineries	-0.04	0.03	0.02	-0.33	0.01	0.01
Miscellaneous Petroleum and Coal Products	-0.48	0.00	0.00	-0.95	0.00	0.00
Rubber Products	-0.74	0.00	0.01	-0.72	0.00	0.01
Plastic Products	0.41	0.02	0.01	-0.36	0.01	0.01
Pottery, China, Earthenware	0.75	0.00	0.00	0.28	0.00	0.00
Glass and Products	-0.39	0.00	0.01	-0.62	0.00	0.01
Other Nonmetallic Mineral Products	-0.67	0.00	0.01	-0.90	0.00	0.01
Iron and Steel	-0.78	0.02	0.09	-0.93	0.00	0.04
Nonferrous Metals	0.40	0.08	0.02	-0.01	0.02	0.01
Metal Products	-0.51	0.01	0.03	-0.53	0.01	0.03
Nonelectrical Machinery	-0.88	0.01	0.12	-0.15	0.18	0.17
Electrical Machinery	-0.01	0.16	0.12	-0.04	0.47	0.36
Transport Equipment	-0.91	0.00	0.07	-0.66	0.02	0.08
Professional and Scientific Equipment	-0.81	0.00	0.01	-0.27	0.02	0.02
Other Manufactured Products	0.43	0.02	0.01	0.28	0.01	0.01

The analysis is restricted to individuals who were 15 years or older, worked in the reference quarter, and whose primary job entailed wage or salaried work of at least 35 hours per week on average over the quarter. Total wage and salary earnings on the primary job for the quarter are divided by the total number of hours worked on the primary job in order to arrive at the individual's hourly wage rate.[13, 14] Deflating these hourly earnings by the national CPI gives real wages in 1997 pesos. Table 3 presents summary statistics of the sample of these wage and salary workers.[15] Real wages in the sample have grown by around 1.2 percent per annum over the 9-year period covered. The average age of workers has been around 33–34 years with around 61–62 percent being male. The average years of education, which increased from 10.06 years in 1988 to 10.50 years in 1997, is fairly high by developing country standards. The increase in years of education is reflected in a decrease in the percentage of workers with "only primary education or less" and an increase in the percentage of workers with a "high school degree" or more. Around 17–19 percent of wage and salary workers in the sample belong to the manufacturing sector.

Table 4 presents summary statistics for the manufacturing sample and separate data for the nontradeables sample (construction, utilities, and services). It also presents some measures of dispersion for real wages. Importantly, wage inequality, which tends to be lower in the manufacturing sector, has declined in the manufacturing sector in terms of a number of measures of dispersion. Wage inequality has also declined in the nontradeable sector, but often only marginally. Consider the difference between the 90th percentile and 10th percentile wages over the 1988 and 1997 period. These decreased by 0.066 log wage points in the manufacturing sector while the corresponding figure in the nontradeables sector was a decline of 0.005. In similar fashion, while the Gini coefficient on wages declined from 0.358 in 1988 to 0.321 in 1997 in the manufacturing sector, the corresponding figures for the nontradeables sector were a decline from 0.419 to 0.409.

What appears to be driving these results is the fact that wage growth was almost equally high at the low (10th percentile) and high (90th percentile) ends of the wage distribution in the nontradeables sector. In the manufacturing sector, however, they were almost twice as high in the low end of the wage distribution as compared to the high end. These statistics reveal a pattern of wage adjustments over a period of liberalization that are very much at odds with those typically found for previous studies from Latin American countries. For example, Feliciano (2001) reports increasing inequality in the tradeables sector in Mexico driven by

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[13] It may be noted that only about 2.15 percent of the workers with a wage/salaried primary job also reported a wage/salaried secondary job. For the "full time" workers this is naturally much lower, less than 1 percent.

[14] An examination of the reported earnings and hours worked suggested the need for some data-cleaning procedures. Observations that yielded hourly wage rates below P1 and above P500 were deleted. In addition, a small number of observations that reported normal working hours per day in excess of 24 hours were also deleted. Finally, individuals reporting between 16 and 24 hours of work were recoded to 16 hours.

[15] The available LFS data did not include a consistently defined set of sample weights across years. Thus sample weights could not be used in the analysis.

rapid growth of the highest wage earners and declines in wage growth of the lowest wage earners.

Table 3. **Summary Statistics for Full-time Workers**

Variable	**1988**	**1991**	**1994**	**1997**
Average Hourly Wages, 1997 Pesos	18.83	20.55	20.98	23.98
(standard deviation)	(20.20)	(19.98)	(21.02)	(20.91)
Male (percent)	62	61	61	62
Average Age	33.19	33.64	33.95	34.25
(standard deviation)	(11.75)	(11.83)	(11.96)	(11.91)
Average Years of Education	10.06	10.20	10.28	10.50
(standard deviation)	(4.19)	(4.16)	(4.04)	(4.01)
Education Distribution (percent)				
Below Primary Education	11.33	10.18	9.40	8.84
Primary Graduate	17.48	16.99	15.64	14.09
Some High School	10.99	11.36	11.07	11.06
High School Graduate	23.17	23.32	25.71	25.05
Some College	13.55	13.79	14.83	16.19
College Graduate	23.48	24.35	23.34	24.76
Married (percent)	57	58	56	59
Employment by Sector (percent)				
Agriculture	11.12	9.72	9.06	7.00
Mining	1.07	0.80	0.57	0.79
Manufacture	17.54	19.34	18.92	16.80
Utility	1.16	0.97	0.97	1.17
Construction	7.13	8.43	8.46	10.69
Government	10.78	11.39	11.13	12.29
Services	51.20	49.35	50.90	51.27
Observations	14,647	18,826	19,005	29,611

Table 4. **Worker Characteristics by Industry Type**

	Nontradeables				**Manufacturing**			
Worker Characteristic	**1988**	**1991**	**1994**	**1997**	**1988**	**1991**	**1994**	**1997**
Average Hourly Wages	19.54	21.26	21.73	25.14	19.92	22.57	22.68	23.36
(standard deviation)	(21.22)	(19.91)	(22.27)	(21.66)	(19.28)	(22.97)	(19.41)	(19.06)
Average Age	33.59	34.08	34.43	34.84	31.32	32.05	31.79	31.31
(standard deviation)	(11.83)	(11.96)	(12.07)	(12.08)	(10.45)	(10.76)	(10.87)	(10.39)
Male (percent)	57	57	58	60	63	60	61	61
Average Years of Education	10.77	10.87	10.84	10.99	9.59	9.81	10.05	9.97
(standard deviation)	(4.14)	(4.15)	(4.04)	(4.01)	(3.50)	(3.41)	(3.31)	(3.18)
Education (% of workers in each sector)								
Below Primary Education	7.87	7.38	7.10	7.16	8.10	6.78	5.59	5.63
Primary Graduate	15.17	14.87	14.09	12.79	19.31	17.47	14.88	13.89
Some High School	10.32	10.91	10.71	10.66	12.96	11.84	11.38	11.50
High School Graduate	22.77	21.64	24.09	22.70	31.34	34.99	37.11	39.75
Some College	14.44	14.67	15.46	17.00	15.34	15.52	17.27	17.10
College Graduate	29.44	30.52	28.55	29.70	12.96	13.40	13.77	12.14
Dispersion of Real Wages								
Standard deviation of log wages	0.89	0.89	0.84	0.87	0.67	0.66	0.64	0.62
Gini coefficient	0.42	0.40	0.41	0.41	0.36	0.32	0.33	0.32
10th Percentile	3.44	3.79	4.5	4.92	6.53	7.84	8.15	8.65
90th Percentile	34.16	37.21	36.52	48.3	32.93	33.49	35.5	37.5
Observations	10,292	13,204	13,581	22,330	2,569	3,641	3,595	4,976

Turning to sample worker characteristics across industries within manufacturing, industry-level trade data are matched with workers' industry of employment. Table 5 presents various summary statistics by level of protection in 1988. Industries with the lowest tariff rates (33 percentile or less of the tariff distribution) on average paid the highest wages, had the highest share of educated workers, but accounted for the lowest share of employment.[16] In contrast, sample industries with tariff rates in the highest one third of the distribution on average paid the lowest wages, employed the largest share of females, and had the lowest share of workers with more than a high school education. Thus, protection as captured by average tariff rates tended to be lower for relatively skill-intensive industries. If trade liberalization were aimed at reducing both average tariff levels and the variance in tariff rates across industries, relatively less skill-intensive industries would be subject to the largest declines in protection. Columns 3–6 of Table 5, which present sample worker characteristics by degree of reduction in average tariff rates between 1988 and 1997, shows that is this precisely what happened. Thus, industries in the upper third of the tariff reduction distribution had on average in 1988, the lowest wage rates and the lowest share of workers with more than a high school degree (and largest share of females).

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[16] This is the case regardless whether employment is defined on the basis of the LFS surveys, or figures on employment reported in the industrial production database are used.

Table 5. **Worker Characteristics in 1988 by Tariffs and Tariff Reductions**

	Rank of Tariff in 1988			**Rank of Tariff Reduction: 1997–1988**		
Worker Characteristic	**Lowest**	**Middle**	**Highest**	**Lowest**	**Middle**	**Highest**
Average Hourly Wages, in 1997 Pesos	27.33	19.39	17.63	26.98	20	17.56
(standard deviation)	(24.35)	(17.64)	(17.78)	(26.71)	(19.97)	(14.91)
Male (percent)	70	79	47	80	73	49
Average Age	31.66	31.88	30.76	32.91	31.78	30.47
(standard deviation)	(9.56)	(11.02)	(10.28)	(10.07)	(10.88)	(10.15)
Average Years of Education	11.48	9.19	9.22	11.02	9.25	9.41
(standard deviation)	(3.28)	(3.61)	(3.27)	(3.54)	(3.62)	(3.28)
Education Level (percent)						
Below Primary Education	2.66	10.64	8.07	4.93	10.73	7.01
Primary Graduate	7.51	21.81	21.61	10.68	20.85	20.87
Some High School	8.47	15.38	12.70	9.32	15.18	12.35
High School Graduate	29.78	27.19	35.16	27.95	26.82	36.06
Some College	26.88	12.43	13.46	24.66	13.87	13.52
College Graduate	24.7	12.54	9.00	22.47	12.55	10.18
Observations	413	949	1,189	365	988	1,198

IV. ECONOMETRIC ANALYSIS

The fact that relatively less skill-intensive industries faced large declines in tariffs suggests that all else being the same, trade liberalization should have affected less skilled workers more adversely than others. The econometric analysis below sheds light on whether this was the case.[17]

The impact of trade liberalization on relative industry wages is examined using a two-step procedure as in Gaston and Trefler (1994), Feliciano (2001), and Goldberg and Pavcnik (2001). In the first stage, a commonly used variant of the Mincerian earnings equation is used for each year of data:

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[17] Three industries are dropped from the econometric analysis because they have less than 10 observations in any of the four LFS years (miscellaneous petroleum products; nonferrous metals; and professional and scientific equipment). The estimated industry wage premiums for these industries could be more susceptible to biases on account of outliers.

$$\log\left(w_{\mathrm{ijt}}\right)=\alpha+\beta_{\mathrm{t}}\cdot X_{\mathrm{ijt}}+\gamma_{\mathrm{jt}}\sum_{j} Ind_{\mathrm{ijt}}+\varepsilon_{\mathrm{it}} \qquad (1)$$

where *i, j*, and *t* index individuals, industry of employment, and time; *w* represents real hourly wages; and *X* represents a vector of individual characteristics that include age, age squared, five education dummies, and dummies for male, marriage status, and household head. Also included in *X* are a dummy for whether a worker deems his/her job to be "permanent" (i.e., work that had lasted or expected to last for 1 year or longer) so as to capture some element of job informality, and region dummies to control for region-specific factors influencing wages, including variations in cost of living.

Industry dummies (*Ind*) are included to capture industry wage premiums. In order to facilitate interpretation in the subsequent analysis of industry wage premiums, no industry is omitted in the estimation of equation 1. The dummy variable "trap" is instead avoided by estimating equation 1 by imposing the constraint, $\theta_{\mathrm{t}}\gamma_{\mathrm{t}}=0$, where θ_{t} represents the vector of share of employment by industry and γ_{t} represents the vector of coefficients on the industry dummies (or industry wage premiums). The industry wage premiums so computed have the property that they now represent deviations from the average wage across all industries rather than the usual differential wage with respect to the omitted industry.

In the second stage, the estimated industry wage premiums (γ^*) are pooled across years and combined with trade and industry data in order to estimate the impact of trade on wages:

$$\gamma^{*}_{\mathrm{jt}}=\pi_1 P_{\mathrm{jt}}+\eta_1 T_{\mathrm{jt-1}}+\kappa_1 Z_{\mathrm{jt}}+\delta_1 Y_{\mathrm{t}}+\phi_1 I_{\mathrm{j}}+e_{\mathrm{jt}}\,. \qquad (2)$$

P_{jt} represents trade policy and is captured by average tariff rates while $T_{\mathrm{jt-1}}$ represents measures of imports and exports (lagged in order to alleviate endogeneity concerns). The latter are included, following Goldberg and Pavcnik (2001), in order to control for factors that may affect both wages and trade policy. Since such factors may well affect trade flows, including measures of these as regressors presents a way to check the robustness of the estimated relationship between trade policy and industry wage premiums. Z_{jt} represents observable industry level characteristics such as the capital–labor ratio. Year dummies Y_{t} capture macroeconomic shocks that may independently influence wage premiums and right hand side variables such as tariff rates. Industry dummies I_{j} are included to control for unobservable time-invariant, industry-specific characteristics and thereby explore the relationships in the "within" dimension. In order to account for the fact that the dependent variable has been estimated, equation 2 is estimated using the inverse of the estimated variance of industry wage premiums as weights.

In determining the impact of trade on employment across industries, a similar approach is followed to estimate the following employment equation:

$$\ln(L_{jt}) = \pi_2 P_{jt} + \eta_2 T_{jt-1} + \kappa_2 Z_{jt} + \delta_2 Y_t + \phi_2 I_j + \xi_{jt}, \qquad (3)$$

where L_{jt} represents employment in industry j and year t. Year dummies capture the effects of economywide demand and supply shifters while industry dummies control for unobservable industry characteristics as in equation 2 above. To examine whether trade has affected average hours of work instead, employment is substituted with average hours worked over the reference quarter of the LFS.

A. Earnings Function Estimates

Table 6 describes the estimates of earnings functions (equation 1) for the four years for which LFS data are available. As is typically found in studies of this type, age (the proxy for experience) enters positively while its square enters negatively; men earn more than women, although this effect tends to decline over time; heads of households and married individuals earn more; and those in jobs expected to last a year or longer earn more.

The estimated coefficients on the education dummies indicate substantial returns to college education. This can be seen in terms of Figure 3, which plots the estimated percentage differential between a given level of education and the omitted or reference educational category, those who have not completed primary education.[18] The vertical distance between any two adjacent levels of education also gives a sense of the marginal value associated with the higher of the two levels of education. For all but the highest level of education, these vary between around 0.10 to 0.25. For the highest level of education, they are much larger (between 0.75 and 0.95). Admittedly, it is possible that unobservable worker characteristics such as natural ability or family background lead the estimates of returns to education to be biased. Thus, for example, a finding of high returns to higher education may reflect the selection of high-ability individuals into college thereby overstating the true gains from higher education. However, the paper's interest is not so much in the returns to education itself but in how the returns to education have evolved over the period of the Philippines's reforms. As long as economic reforms did not affect the selection criteria used by individuals in deciding the level of desired educational attainment, it is possible to get a sense of the true evolution of returns to education by comparing the wage differentials associated with the various levels of education over time.

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[18] The estimated coefficients on the education dummies are converted into the percentage differential in earnings relative to the reference group (those who have not completed primary education) as: $\left[e^{b_{vt}} - 1\right]$ for the various education levels v.

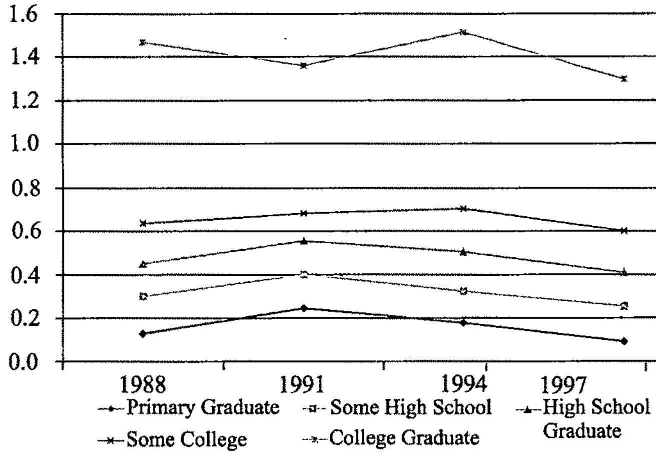
Table 6. **Estimates of Earnings Function (dependent variable=log(real hourly wage))**

Dependent Variable	**1988**	**1991**	**1994**	**1997**
Age	0.035***	0.016***	0.023***	0.035***
	(5.66)	(3.16)	(5.13)	(8.06)
Age Square	-4.0E-04***	-1.2E-04**	-2.0E-04***	-4.0E-04***
	(5.05)	(1.97)	(3.52)	(6.90)
Primary Graduate	0.120***	0.218***	0.163***	0.089***
	(2.71)	(5.48)	(3.85)	(2.52)
Some High School	0.261***	0.335***	0.278***	0.225***
	(5.43)	(7.86)	(6.29)	(6.18)
High School Graduate	0.370***	0.441***	0.409***	0.343***
	(8.49)	(11.50)	(10.26)	(10.51)
Some College	0.491***	0.520***	0.532***	0.468***
	(10.22)	(12.41)	(12.51)	(13.31)
College Graduate	0.903***	0.859***	0.922***	0.831***
	(18.15)	(19.75)	(20.75)	(22.22)
Male	0.165***	0.096***	0.054***	0.062***
	(5.81)	(4.16)	(2.50)	(3.38)
Head of Household	0.181***	0.181***	0.123***	0.168***
	(5.61)	(6.90)	(4.73)	(8.09)
Married	0.050*	0.030	0.085***	0.053***
	(1.74)	(1.30)	(3.72)	(2.84)
Permanent Job	0.193***	0.208***	0.144***	0.088***
	(5.90)	(7.45)	(5.69)	(4.33)
Constant	1.445***	1.937***	1.884***	1.908***
	(12.65)	(20.61)	(21.36)	(23.85)
R-Square	0.40	0.39	0.40	0.38
Observations	2551	3629	3565	4903

Note: Absolute t-statistics in parenthesis. * significant at 10%; ** significant at 5%; *** significant at 1%.

The estimated returns to the various levels of education do not show a clear trend over time. Returns to the highest level of education decline between 1988 and 1991, spike up in 1994, and then decline once again in 1997. For all but the highest level of education, returns first increase mildly between 1988 and 1991 (1994 in the case of the second highest level of education), then they decline.

Figure 3. **Percentage Differential Returns to Education, 1988–1997 (versus some or no primary education)**



The absence of a secular increase in returns to education is quite different from what is typically reported for Latin American countries. While the studies covering the latter find large increases in the returns to higher education over the periods in which trade liberalization was undertaken, no trend toward this effect is seen from the data. Indeed, focusing on the longer 1988 and 1997 comparison, returns to college education have declined relative to every other educational category. Of course, without further analysis it is not possible to say that it was trade per se that led to this. Nevertheless, this finding is highlighted because it is one that contrasts with patterns observed elsewhere.

B. Industry Wage Premiums and Trade

As noted above, the coefficients on the industry dummies obtained from equation 1 are estimates of industry wage premiums.[19] The wage premiums are found to be generally low in apparel, footwear, food, leather, and wood products—all labor-intensive industries (see Table 7a). They tend to be high in petroleum refining, industrial chemicals, electrical machinery, and transport equipment—all capital-intensive industries. This can formally be seen from Table 7b, which presents simple correlations between estimated wage premiums and various industry level characteristics, including capital–labor ratios and tariff rates, for 1988. The correlation between wage premiums and the log of the capital–labor ratio is 0.80 or higher.[20] Similarly, industries with a higher share of skilled workers (i.e., with some college education or more) tend to have higher wage premiums. These correlations are consistent with findings for other countries whereby capital/skill-intensive industries have the highest wage premiums (see, for example, Dickens and Katz 1987 for the US; and Moll 1993 for South Africa).

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[19] The correlations of these premiums across the four sample years are typically fairly high (between 0.81 and 0.84) for 1988, 1994, and 1997. The correlation between premiums in 1991 and each of the other three years is lower (between 0.38 and 0.55). This is partly driven by a premium for petroleum refining, which is relatively low in 1991 as compared to the other years. Excluding this industry from the analysis did not change results in any significant way, however.

Table 7a. **Industry Wage Premiums (1988 and 1997)**

Industry	**1988**	**1997**
Food	-0.02	-0.12
Beverage	0.31	0.15
Tobacco	0.18	0.16
Textiles	0.01	0.02
Apparel	-0.09	-0.07
Leather	-0.13	-0.13
Footwear	-0.05	-0.32
Wood Products	0.02	-0.09
Furniture	-0.14	-0.02
Paper and Products	-0.11	0.13
Printing and Publishing	0.00	-0.01
Industrial Chemicals	0.27	0.22
Other Chemicals	0.11	0.14
Petroleum Refineries	0.86	0.54
Rubber Products	0.08	0.07
Plastic Products	0.04	0.04
Pottery, China, Earthenware	-0.06	-0.07
Glass and Products	0.06	0.05
Other Nonmetallic Mineral Products	-0.16	-0.02
Iron and Steel	0.32	0.17
Metal Products	-0.02	0.07
Nonelectrical Machinery	-0.12	0.12
Electrical Machinery	0.25	0.17
Transport Equipment	0.23	0.11
Other Manufactured Products	-0.08	-0.07

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[20] The correlations for other years are similar and not reported.

Table 7b. **Correlation Matrix for Selected Variables, 1988**

	Wage Premium	**Log K/L**	**Skill/ Less Skilled**	**Tariff Rate**	**Net Trade**	**Export Ratio**	**Import Ratio**	**Log Employment**
Wage Premium	1							
Log K/L	0.840	1						
	(0.000)							
Skill/Less Skilled	0.567	0.671	1					
	(0.003)	(0.000)						
Tariff Rate	-0.498	-0.694	-0.685	1				
	(0.011)	(0.000)	(0.000)					
Net Trade	-0.261	-0.466	-0.620	0.618	1			
	(0.208)	(0.019)	(0.001)	(0.001)				
Export Ratio	-0.360	-0.511	-0.634	0.380	0.772	1		
	(0.077)	(0.009)	(0.001)	(0.061)	(0.000)			
Import Ratio	-0.091	0.016	0.203	-0.450	-0.361	-0.029	1	
	(0.665)	(0.940)	(0.330)	(0.024)	(0.077)	(0.893)		
Log Employment	-0.334	-0.312	-0.364	0.350	0.179	0.055	-0.082	1
	(0.103)	(0.129)	(0.073)	(0.086)	(0.392)	(0.793)	(0.697)	

Note: Number in parenthesis is the associated correlation coefficient's P-value.

As in the case of the US, wage premiums are inversely correlated with tariff rates so that trade protection is higher in lower wage industries (Gaston and Trefler 1994 and 1995). But unlike the US, greater export orientation in terms of higher export ratios and net trade ratios are associated with lower wage premiums (significantly so in some cases). Thus as the analysis of Section III using industry-level data alone indicated, protection seems to have been larger in industries in which the Philippines would have been expected to have a comparative advantage, i.e., in the less capital/skill-intensive industries. The positive correlation between employment levels and tariff rates (last row) may suggest why this was so. Policymakers may have been trying to protect industries with the largest levels of employment.

How did the removal of protection affect workers? The estimates of equation 2, described in Table 8, shed light on this. In a model without industry fixed effects or industry characteristics, the coefficient on tariffs is negative and statistically significant (column 1). The estimated coefficient on tariffs implies that a 1 percentage point decline in tariffs is associated with a 0.9 percentage point increase in the industry wage premium. A 20 percentage point decline in tariffs—the difference between some of the highest and lowest tariff rates across industries—would then be associated with a 18 percentage point gain in the industry wage premium.

Table 8. **Relative Wages and Trade Protection I (dependent variable=estimated industry wage differentials)**

Independent Variable	1	2	3	4	5	6	7	8	9
Tariff Rate	-0.009***	-0.006**	-0.008***	-0.004	-0.004	-0.002	0.000[a]	0.000[a]	0.000[a]
	(5.51)	(1.97)	(3.59)	(1.42)	(1.43)	(0.80)	(0.04)	(0.24)	(0.27)
Log Lagged Real Import		0.016			-0.006			0.003	
		(1.50)			(0.63)			(0.21)	
Log Lagged Real Export		-0.019*			-0.006			0.015	
		(1.73)			(0.56)			(0.85)	
Lagged Import Ratio			0.020			0.013			-0.023
			(1.04)			(0.92)			(0.68)
Lagged Export Ratio			-0.025			0.033			0.027
			(0.67)			(1.05)			(1.14)
Log K/L				0.048**	0.053***	0.061***			
				(2.40)	(2.81)	(3.16)			
Industry Dummies	No	No	No	No	No	No	Yes	Yes	Yes
R-Square	0.293	0.339	0.303	0.388	0.404	0.415	0.823	0.825	0.825
Observations	100	100	100	100	100	100	100	100	100

[a] Absolute value of the estimated parameter is zero to the third decimal place.

Note: All regressions include year dummies. Absolute, robust t-statistics in parenthesis. * significant at 10%; ** significant at 5%; *** significant at 1%.

Adding regressors that relate to trade flows does not change the relationship between tariffs and industry wage premiums (columns 2 and 3). The estimated coefficients on the import and export terms, introduced with a one-period lag to alleviate endogeneity concerns, are consistent with the bivariate correlations so that more export-oriented industries tend to have lower wage premiums and vice versa (though only one of the estimated coefficients relating to the various import and export terms is significant at the 10 percent level).

The negative relationship between tariffs and wage premiums should not be taken to indicate that trade liberalization will lead to higher wages. After all tariff rates are not set randomly across industries and thus the estimates just presented are potentially biased. Consider, for example, a situation where political economy considerations drive policymakers to consider industry characteristics in setting tariff rates. Policymakers may aim to protect labor-intensive industries and/or industries with large levels of employment as noted above. Since such industries also have low wage premiums, tariffs would enter the wage premium equation with a negative coefficient, but this coefficient would suffer from omitted variable bias.[21] There are two ways of dealing with this bias. One is to include the pertinent industry characteristics as regressors and/or include industry fixed effects in estimation in case the included industry characteristics may not capture the key (time-invariant) factors that determine trade policy. The latter strategy would be important if, for example, unionization of a sector (which the present study has no information on) is a slow-to-change characteristic of industries and an important determinant of both wage premiums and trade policy.

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[21] Interestingly, the negative effect of tariffs on wage premiums would have been larger (almost twice as large) had wage premiums been estimated based on a first-stage regression of log wages on industry dummies alone. Thus as pointed out by Gaston and Trefler, ignoring

Controlling for industry characteristics in estimation makes the coefficient on tariff rates smaller in absolute size; it also makes the coefficient statistically insignificant at the 10 percent level. This is shown in columns 4–6 where the log of the capital–labor ratio is included as an additional regressor. The various trade-related variables also lose whatever significance they had. Switching to industry fixed effects has an even more dramatic effect (columns 7–9). The coefficient on tariffs becomes positive in every specification so that a lowering of tariff rates is associated with a decline in wage premiums. But the effects have very small t-statistics. Taken together, the estimates of columns 4–9 suggest that the estimates of columns 1–3 suffer from omitted variable bias and that trade liberalization in fact had little impact on wage premiums across industries.

It is fairly common to find that trade liberalization has had only modest effects on wages (see, for example, the survey by Harrison and Hanson 1999). The results above appear to be in line with these other studies. [22] At the same time, however, reductions in protection may have more of an impact on wages of certain types of workers or industries even if their effects are limited on average.

First, trade liberalization may have affected wage premiums differently for various types of labor. For example, trade liberalization may have altered production methods thereby affecting the relative demand for skilled and less skilled workers. Indeed, results from trade-labor studies of Latin American countries have typically stressed the role of trade liberalization in raising the relative demand for skilled workers by introducing skill-intensive methods of production. Alternatively, as Feliciano (2001) notes it is possible that the bargaining power of workers varies by skill level. Thus Table 9 presents results of wage premium equations for two groups of workers, skilled workers (those with more than a high school degree) and less skilled workers (those with a high school

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worker characteristics in an analysis of industrial wages and trade can exaggerate the relationship between trade and labor market outcomes, because to some extent workers are sorted across industries on the basis of such observable characteristics as education, age, and occupation. Since trade and trade policy are not uniform across industries, there is potential for some endogeneity between worker characteristics and trade.

[22] Due to the unavailability of information on nontariff barriers to trade their impact cannot be assessed directly. But in view of the fact that nontariff barriers and changes therein may well be reflected in terms of imports and exports, the insensitivity of wage premiums to the various trade-related variables suggests that trade liberalization in general did not impact wage premiums significantly.

degree at most).[23] Industry dummies are always included in estimation. None of the estimates on tariff rates are significant in either equation. If anything, the fact that all the tariff coefficients for the skilled workers' equation are positive while those for less skilled are essentially zero or even slightly negative is suggestive of the possibility that trade liberalization in the Philippines, unlike that in Latin American countries, exerted some pressure on skilled workers' wages.

Table 9. **Relative Wages and Trade Protection II**
(dependent variable=estimated industry wage differentials)

	Skilled Workers			**Less Skilled Workers**		
Independent Variable	**1**	**2**	**3**	**4**	**5**	**6**
Tariff Rate	0.003	0.003	0.004	-0.001	0.000[a]	0.000[a]
	(0.86)	(0.95)	(0.98)	(0.26)	(0.06)	(0.01)
Log Lagged Real Import		-0.023			0.012	
		(1.16)			(0.61)	
Log Lagged Real Export		0.041*			0.004	
		(1.88)			(0.20)	
Lagged Import Ratio			-0.029			-0.032
			(0.56)			(0.82)
Lagged Export Ratio			0.046*			0.024
			(1.90)			(0.73)
R-Square	0.705	0.719	0.711	0.796	0.798	0.798
Observations	100	100	100	100	100	100

[a] Absolute value of the estimated parameter is zero to the third decimal place.

Note: All regressions include year and industry dummies. Absolute, robust t-statistics in parenthesis. *significant at 10%; **significant at 5%; ***significant at 1%.

Second, the effects of trade liberalization on wage premiums may be influenced by broad industry characteristics such as capital intensity. For example, it is likely that workers are better organized/have greater bargaining power in capital-intensive industries. Firms tend to be larger in capital-intensive industries and workers are likely to be better organized in large firms. Additionally, unionization is typically less effective the more competitive an industry. Since barriers to entry are likely to be higher in capital-intensive industries, especially in a developing country, these may be the ones with a more inelastic product demand curve and hence a more inelastic labor demand curve. The latter enables unions to be more effective in winning wage increases without exacerbating employment losses, thereby encouraging union activity. The reduction of trade protection may therefore adversely affect workers in capital-intensive industries since these are the industries in which workers would have been able to enjoy a portion of protection-related rents.[24]

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[23] The two sets of wage premiums are based on separate earnings functions.

[24] Although data on unionization by 3- (or even 2-) digit industry is unavailable, Dejillas's (1994) study of trade union behavior in the Philippines and discussion of the membership profile of the Federation of Filipino Workers, one of the largest trade unions in the Philippines,

To examine whether there is any evidence for workers in capital-intensive industries to be affected adversely by declines in trade protection, tariff rates are interacted with the log of the capital–labor ratio in estimating the wage premium equations. Table 10 presents the results. The interaction term is positive and significant at the 10 percent level in columns 1and 2 and marginally so in column 3. This indicates that in the more capital-intensive industries, trade liberalization did lead to declines in wage premiums. At the 75th percentile value of the capital–labor ratio (2.40), for example, a 1 percentage point decline in tariffs is associated with a 0.61 percentage point decline in the wage premium in terms of the estimates of column 2 (100**dy*/*d*[tariffs] = 100* [0.0022 + 0.0016 * 2.40]).[25] The associated F-test is significant at the 10 percent level. Estimating wage premiums for skilled and less skilled workers separately and repeating the analysis reveals that the decline in wage premiums as a result of tariff reductions is

Table 10. **Relative Wages and Trade Protection with Interaction Effects (dependent variable=estimated industry wage differentials)**

	All Workers			**Skilled Workers**			**Less Skilled Workers**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Tariff Rate	0.002	0.002	0.003	0.005	0.005	0.005	0.002	0.002	0.002
	(1.09)	(1.20)	(1.25)	(1.38)	(1.60)	(1.52)	(0.73)	(0.71)	(0.82)
Tariff Rate* Log K/L	0.002*	0.002*	0.002	0.002	0.002	0.001	0.002	0.002	0.002
	(1.78)	(1.73)	(1.61)	(1.30)	(1.60)	(1.19)	(1.58)	(1.57)	(1.39)
Log K/L	0.026	0.029	0.033	0.054	0.035	0.060	-0.007	-0.005	-0.001
	(0.77)	(0.77)	(0.92)	(0.89)	(0.53)	(0.98)	(0.17)	(0.12)	(0.03)
Log Lagged Real Import		-0.004			-0.031			-0.000	
		(0.28)			(1.29)			(0.01)	
Log Lagged Real Export		0.018			0.045**			0.004	
		(1.15)			(2.03)			(0.21)	
Lagged Import Ratio			-0.005			-0.014			-0.008
			(0.17)			(0.28)			(0.20)
Lagged Export Ratio			0.024			0.041*			0.016
			(1.09)			(1.68)			(0.49)
P value of F Test	0.11	0.10*	0.10*	0.13	0.07*	0.12	0.19	0.19	0.20
R-squared	0.84	0.84	0.84	0.72	0.74	0.73	0.81	0.81	0.81
Observations	100	100	100	100	100	100	100	100	100

Note: All regressions include year and industry dummies. Absolute, robust t-statistics in parenthesis. *significant at 10%; **significant at 5%; ***significant at 1%. F test pertains to the null hypothesis that the marginal effect of tariff rates is zero. The marginal effect is evaluated at the 75th percentile value of the capital–labor ratio.

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suggests that workers in more capital-intensive industries may have been more organized in the 1980s.

[25] The estimated coefficients are rounded to the third decimal place in the tables.

stronger among skilled workers. For example, evaluated at the 75th percentile value of the capital–labor ratio, the marginal effect of tariffs (*dy*/*d*[tariffs]) on wage premiums is 0.0084 (and significant at the 10 percent level) in column 5 versus 0.0063 (and insignificant) in column 7.[26] This suggests that skilled workers in capital-intensive industries faced greater downward pressure on their wages as a result of trade liberalization.

C. Employment and Trade

The relationship between employment and trade is examined by regressing employment by industry on tariff rates and various trade flow measures as in equation 3. Without the inclusion of industry effects, tariff reductions are found to be associated with reductions in employment (not reported due to space limitations). However, since this result may be driven by the fact that tariff rates have been higher in industries with larger employment (see the relevant correlation in Table 7b), industry effects are introduced to check whether the relationship between tariffs and employment remains positive in the "within" direction. Table 11 describes the results when both industry effects as well as an interaction term between tariff rates and the capital–labor ratio are included in estimation.[27] Although the interaction term between tariff rates and the capital–labor ratio are negative and significant in columns 1–3 (driven by the case of skilled workers as columns 4–6 reveal), the P-values relating to the marginal effect of tariffs indicate that in all cases tariff reductions are found to affect employment only weakly. Moreover, to the extent that there is a marginally significant relationship (columns 5 and 6), tariff reductions in relatively capital-intensive industries are associated with slight increases in employment of skilled workers.[28] In addition, increases in imports, whether in terms of levels or as proportion of domestic output, are also associated with increases in the employment of skilled workers. These findings therefore suggest that trade did not adversely affect employment.

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[26] A similar pattern emerged when the capital–labor ratio was interacted by imports in levels. Thus, higher imports put downward pressure on wage premiums, especially among the higher skilled.

[27] It may be noted that tariffs have an insignificant effect on employment (for all, skilled, and less skilled workers) in specifications without the interaction term between tariffs and the capital–labor ratio.

[28] The reported P-values are based on the 75th percentile value of the capital–labor ratio.

Table 11. **Employment and Trade Protection (dependent variable=log(employment))**

	All Workers			**Skilled Workers**			**Less Skilled Workers**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Tariff Rate	0.009	0.01	0.006	-0.005	0.002	-0.009	0.020	0.022	0.018
	(0.87)	(1.16)	(0.64)	(0.37)	(0.16)	(0.71)	(1.36)	(1.50)	(1.23)
Tariff Rate* Log K/L	-0.008***	-0.011***	-0.008**	-0.008*	-0.012**	-0.007*	-0.006	-0.008	-0.006
	(2.76)	(3.10)	(2.65)	(1.90)	(2.65)	(1.69)	(1.19)	(1.24)	(1.13)
Log K/L	0.268**	0.287**	0.257**	0.292*	0.340**	0.277*	0.230	0.231	0.221
	(2.19)	(2.39)	(2.01)	(1.85)	(2.16)	(1.68)	(1.31)	(1.24)	(1.24)
Log Lagged Real Import		0.127			0.239**			0.053	
		(1.31)			(2.02)			(0.46)	
Log Lagged Real Export		0.137			0.102			0.164	
		(1.23)			(1.03)			(1.19)	
Lagged Import Ratio			0.196			0.363*			0.108
			(1.28)			(1.72)			(0.72)
Lagged Export Ratio			-0.127			-0.147			-0.126
			(1.19)			(0.96)			(1.09)
P value of F Test	0.45	0.36	0.41	0.20	0.12	0.16	0.86	0.90	0.88
R-squared	0.94	0.95	0.95	0.91	0.92	0.92	0.93	0.93	0.93
Observations	100	100	100	100	100	100	100	100	100

Note: Regressions include year and industry dummies. Absolute, robust t-statistics in parenthesis. *significant at 10%; **significant at 5%; ***significant at 1%. F test pertains to the null hypothesis that the marginal effect of tariff rates is zero. The marginal effect is evaluated at the 75th percentile value of the capital–labor ratio.

It is possible that trade affected employment not so much in terms of employee counts but rather in terms of the amount of hours worked. To examine this possibility, LFS data and average hours worked (for those working at least 35 hours a week on average over the reference quarter) are used in place of employee counts in equation 3. Table 12 describes the results for specifications in which industry fixed effects and an interaction term between tariff rates and the capital–labor ratio are included in estimation.[29] The P-values relating to the marginal effect of tariffs indicate that tariff reductions had no significant impact on average hours worked. This is true for all workers taken together (columns 1–3) as well as for skilled and less skilled workers considered separately (columns 4–6 and 7–9, respectively).[30, 31]

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[29] As with employment, tariffs have an insignificant effect on average hours worked (for all, skilled, and less skilled workers) in specifications without the interaction term between tariffs and the capital–labor ratio.

[30] For less skilled worker reductions, the interaction term between tariffs and the capital–labor ratio is negative and significant indicating that a reduction in tariffs put upward

V. CONCLUDING REMARKS

The analysis of this paper suggests that trade liberalization has had fairly modest effects on both relative industry wages as well as employment. In particular, declines in average tariff rates have on average tended to leave industry wage premiums and employment roughly unchanged. Nevertheless, not all groups of workers have been unaffected by liberalization. Workers in capital-intensive industries, especially skilled ones, saw their wages come under pressure from tariff reductions.

The fact that less skilled workers more generally did not experience negative outcomes from tariff reductions is surprising because labor/less-skill intensive industries were the ones that started out with the highest tariff rates and where tariff reductions over the period under consideration tended to be the largest. Less skilled workers would be expected to face the brunt of liberalization in terms of the predictions of either the standard Heckscher-Ohlin model (via lower relative prices of labor-intensive goods due to relatively larger tariff reductions in labor-intensive industries) or the specific-factors model (via greater import competition in labor-intensive industries).

That it was the skilled workers in capital-intensive industries whose wages were adversely affected by trade liberalization suggests that influences other than ones emphasized by traditional trade models may have been at work. For example, it is possible that reductions in tariffs of labor-intensive industries did not hurt workers in these industries because firms were able to raise their productivity more easily. The initial gap between international and domestic productivity may have been least in labor-intensive industries and/or it may have been easiest to bridge. Alternatively, workers in capital-intensive industries may have been better organized prior to liberalization—something for which there seems to be some (indirect) support. Thus under a protected trade regime they may have been able to extract better wages from their employers; trade liberalization would have put pressure on this rent-related component of wages.

Of course, it remains possible that the average tariff rates used in this study as the measure of trade policy is more imperfect than assumed. One focus of future research should be on obtaining other measures of trade policy, including more direct measures of nontariff barriers. This way, the robustness of the present

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pressure on hours of work in capital-intensive industries (columns 7 and 8). As noted however the full effect of tariffs on hours worked (i.e., taking into account the direct tariff term as well as the interaction term) fails to be significant at conventional levels.

[31] The estimates of Table 12 also indicate that increases in imports (exports) were associated with greater (less) hours worked for skilled workers. The finding is not very robust, however, since import and export ratios—measures of trade that are less susceptible to endogeneity concerns—display little meaningful association with hours worked.

results can be tested. Future research should also consider obtaining data on union activities across industries and other factors that can raise the bargaining power of workers, such as the presence of public sector enterprises. Finally, an interesting feature of the earnings functions estimates is that of stable/declining returns to higher education. While it represents another and more broad-based way that skilled workers were hurt during the period under consideration, it remains to be seen whether trade liberalization was a driving force. Extending the data set developed in this paper to incorporate these industry-specific characteristics and updating the labor force information from more recent rounds of the labor force survey should certainly enable research to shed more light on what is a very important development issue.

REFERENCES

Chu, T., R. Hasan, and S. Lee, 2002. The Impact of Trade on Workers: Evidence from the Philippines. Working Paper Series No. 17, International Center for the Study of East Asian Development, Japan.

Currie, J., and A. Harrison, 1997. "Sharing the Costs: The Impact of Trade Reform on Capital and Labor in Morocco." *Journal of Labor Economics* 15:44-71.

Dejillas, L. J., 1994. Trade Union Behavior in the Philippines 1946-1990. Manila: Ateneo de Manila University Press.

Dickens, W. T., and L.F. Katz, 1987. "Inter-industry Wage Differences." In K. Lang and J. S. Leonard, eds., *Unemployment and the Structure of Labor Markets*. New York: Basil Blackwell.

Feliciano, Z. M., 2001. "Workers and Trade Liberalization: The Impact of Trade Reforms in Mexico on Wages and Employment." *Industrial and Labor Relations Review* 55:95-115.

Gaston, N., and D. Trefler, 1994. "Protection, Trade, and Wages: Evidence from U.S. Manufacturing." *Industrial and Labor Relations Review* 47:574-93.

———, 1995. "Union Wage Sensitivity to Trade and Protection: Theory and Evidence." *Journal of International Economics* 39:1-25.

Goldberg, P. K., and N. Pavcnik, 2001. Trade Protection and Wages: Evidence from the Colombian Trade Reform. NBER Working Paper 8575, National Bureau of Economic Research, Cambridge, Massachusetts.

Grossman, G. M., 1984. "International Competition and the Unionized Sector." *Canadian Journal of Economics* 17:541-56.

Harrison, A., and G. Hanson, 1999. "Who Gains from Trade Reform?—Some Remaining Puzzles." *Journal of Development Economics* 59:125-54.

Kambhapati, U., P. Krishna, and D. Mitra, 1997. "The Effect of Trade Policy Reforms on Labour Markets: Evidence from India." *Journal of International Trade and Economic Development* 6:287-97.

Manasan, R. G., and V. S. Pineda, 1999. *Assessment of Philippine Tariff Reform: A 1998 Update*. Philippine Institute for Development Studies, Manila, Philippines.

Manasan, R. G., and R. G. Querubin, 1997. Assessment of Tariff Reform in the 1990s. Discussion Paper Series 97-10, Philippine Institute for Development Studies, Manila, Philippines.

Medalla, E. M., 1990. An Assessment of Trade and Industrial Policy, 1986-1988. PIDS Working Paper 90-07, Philippine Institute for Development Studies, Manila, Philippines.

Moll, P. G., 1993. "Industry Wage Differentials and Efficiency Wages." *Journal of Development Economics* 41: 213-46.

Nicita, A., and M. Olarreaga, 2001. *Trade and Production Database*. World Bank, Washington, DC.

Ravenga, A., 1997. "Employment and Wage Effects of Trade Liberalization: The Case of Mexican Manufacturing." *Journal of Labor Economics* 15(3, July):S20-43.

Robbins, D., and T. H. Gindling, 1999. "Trade Liberalization and the Relative Wages for More-Skilled Workers in Costa Rica." *Review of Development Economics* 3:140-54.

Suryahadi, A., 1999. "Wage Inequality between Skilled and Unskilled Labor in Indonesian Manufacturing." *Economics and Finance in Indonesia* 47:271-88.

———, 2003. "International Economic Integration and Labor Markets: The Case of Indonesia." In R. Hasan and D. Mitra, eds., *The Impact of Trade on Labor: Issues, Perspectives, and Experiences from Developing Asia*. Amsterdam: Elsevier.

World Bank, 2000. *Philippines Growth with Equity: The Remaining Agenda*. World Bank, Washington, DC.

Rice Production, Land Use Dynamics, and Infrastructure Development in Viet Nam's Mekong River Delta

CHRISTOPHER EDMONDS

This study examines the role of infrastructure development and technical change in explaining increases in agricultural production and changes in land use in the Mekong Delta Region of Viet Nam during the 1990s. The study analyzes longitudinal farm survey data from eight villages. A model is developed that combines spatial factors in a neoclassical production framework to examine changes in land use and agricultural technology. Major findings are that the transportation costs involved in moving agricultural input and output between farms and markets significantly affect farmland use and production decisions. Greater transport costs reduced the likelihood that farms would adopt intensive cropping patterns or cultivate nonrice crops. Results also suggest that quality of local water management infrastructure is more important than transport costs in explaining the increased intensity of land use and level of production observed in the Mekong Delta during the 1990s. A simulation model is developed to highlight the implications of findings for future policy aimed at increasing rice production or altering land use in the Mekong Delta.

I. INTRODUCTION

The increase in rice production in Viet Nam during the 1990s represents a recent success story in Asian agricultural development. The increase in national production took the country from having a large deficit between rice demand and supply domestically, to becoming the third largest rice exporter worldwide. This expansion has contributed to the country's high growth rate by providing urban areas with cheap food and generating foreign exchange. Increases in rice production in the Mekong River Delta, which supplies about half of Viet Nam's total rice production, averaged about 6.3 percent per year during the 1990s according to official statistics. Although the rapid growth in rice production in

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Viet Nam is well documented, there have been few studies of the changes in farming practices and in market and physical infrastructure that prompted the changes in rice production and land use, and led to production increases.

Both biophysical and socioeconomic constraints influence land use decisions and limit the production activities of farming families in the Mekong River Delta. Infrastructure development and changes in economic policies modify both types of constraints. This makes understanding these constraints essential to developing technologies and advising on policies to increase agricultural production and spur economic development in the region. Integration of traditional econometric techniques with data organized in a geographic information system (GIS) offers a promising method for modeling constraints. This paper models the relationship between biophysical and socioeconomic characteristics and derives hypotheses concerning the importance of local infrastructure development, market expansion, new technology adoption, and changes in input application in the mid-1990s in explaining production changes observed in the Mekong Delta. Different areas in the Delta can be understood as being emblematic of different levels of agricultural development in the transition from rainfed to irrigated rice agriculture. This makes it a useful case to study, and findings carry broader implications for other areas in Asia that are making the transition between rainfed and irrigated agriculture.

During the years considered in this study, Viet Nam underwent profound changes in its agricultural and land policies. Beginning in 1988 with the adoption of Resolution 10 by the Politburo, Viet Nam undertook an ambitious program of decollectivization of its agriculture and liberalization of agricultural markets. Resolution 10 established farm households as autonomous economic entities in rural areas, and permitted farm families to own capital and land. Land formerly held in agricultural cooperatives was assigned to individual farms under long-term lease agreements.

In 1993, the Seventh Party Congress adopted Resolution 5 and the Road to Industrialization, which strengthened earlier reforms and adopted measures to promote rural industry and migration of workers out of employment in traditional agriculture. Investments in technology transfer (particularly in dissemination of higher-yielding varieties) and water management infrastructure spurred continued rice production increases. Terms of land leases were lengthened, and farms were given the right to exchange, transfer, lease, inherit, and mortgage land. Resolution 5 also sought to renovate and modernize remaining agricultural cooperatives and state-owned industries. During this same period, accompanying economic reforms lowered trade restrictions (although export quotas on rice remained) and led to devaluations in the national currency. Price controls were gradually relaxed on selected inputs and products over the course of the 1990s, and new agricultural firms entered into input and output markets. Marketing channels expanded to more remote rural areas under more competitive conditions than existed previously.[1] The prices of rice and the major chemical inputs to rice production evolved as a result of these market changes, and with changes in local supply/demand and fluctuations in the world price.

The years covered by the panel survey used in this study were marked by large increases in rice production and rice exports. The number of firms permitted to export rice increased and increases in supply both in Viet Nam and worldwide led to real price declines in rice during 1996 and the first half of 1997, but the government subsequently increased regulation of the operations of rice exporters, leading to increases in real prices despite continued growth in production.[2]

While the above description applies to Viet Nam as whole, this study focuses on land use change in the Mekong Delta region of the country. This region differs from the rest of the country in several important respects. Interviews with farmers in the Mekong Delta suggest that the process of agricultural collectivization progressed less in this region than elsewhere in the country. Agricultural cooperatives functioned largely as a legal formality in the Mekong River Delta region, leaving household farms as the ex facto productive unit earlier. There appeared to have been greater willingness among Mekong farmers to apply ex officio land tenure arrangements in deference to tradition. As a result, the effect of Resolution 10 in that region was lesser here than in other regions of Viet Nam. The Delta had long represented one of the most important agricultural regions in the country, and farms in the region tended to be larger and relatively more commercial (as opposed to subsistent) in production orientation.

This study also characterizes the agricultural environment and the household-level responses to changes in this environment brought about through infrastructure development as captured in farm survey, GIS database, and provincial-level statistics. Two important developments in the study area during the 1990s were the "deepening" and geographic expansion of market reforms as agents began expanded operations to more remote areas, and new water control and transport infrastructure was installed. New infrastructure development increased both the area protected from saline water intrusion and the reach of irrigation for dry season rice cultivation.

The paper develops a model that combines spatial factors in a neoclassical production framework to examine the changes in land use and agricultural technology that led to the increased output. Estimable forms of the production, land use, and revenue functions implied by the model are derived. Econometric models make use of panel data estimation procedures that control for the effect of unobserved variables. Estimations on single years of the survey use instrumental variable and system of equation estimators to correct for endogeneity bias in estimates of the effect of variables that are simultaneously determined with the outcomes of interest (e.g., cropping intensity, choice, and production level). The paper concludes by discussing estimation results. A simulation model is developed to highlight policy implications of findings.

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[1] For more detail regarding the institutional changes and new actors in rice marketing channels that emerged over the course of the study period in the Mekong Delta, see Institute of Agricultural Sciences (1997).

[2] Earlier studies that have examined the consequences of agricultural decollectivization and market liberalization in Viet Nam include Pingali and Xuan (1990), and Minot and Goletti (1998).

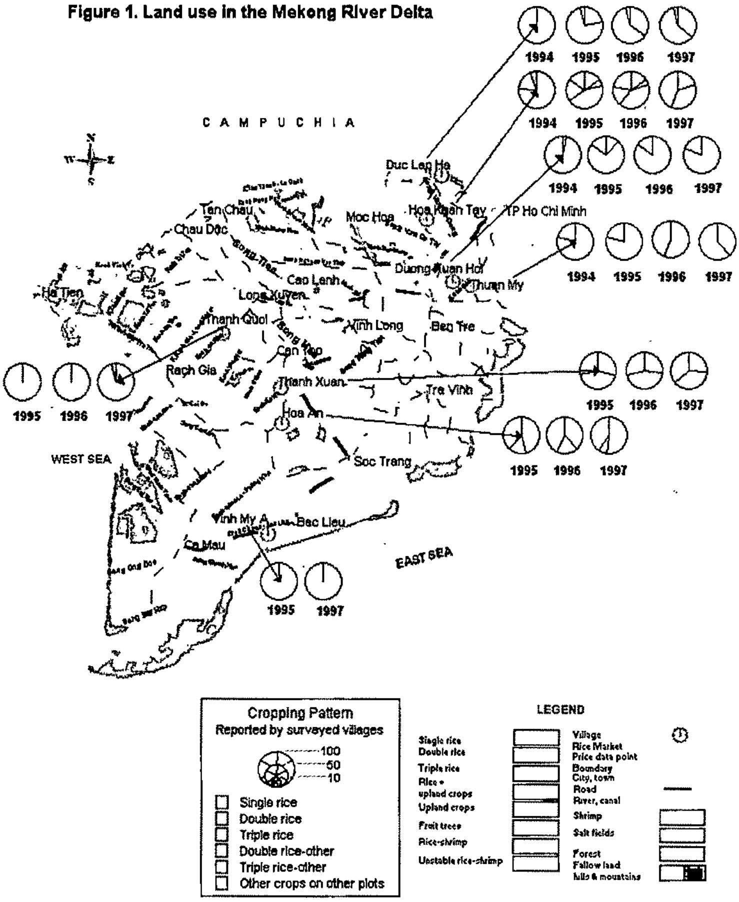
II. DESCRIPTION OF THE STUDY AREA

The study area is described according to the following biophysical characteristics: location of rice producers and accessibility of markets, soil types, level and temporal distribution of rainfall and temperatures, and seasonal flooding or saltwater intrusion on farmland. Figure 1 superimposes land use as reported by farms in the eight surveyed villages on a land use map for the Mekong Delta (circa 1996). The figure indicates the high correspondence between farmland use captured from remote sensing presented on the map and that reported by farms completing the longitudinal survey. Compared to the other major agricultural regions of Viet Nam, the Mekong Delta is most similar to the Red River Delta in the North. The Mekong Delta has higher rainfall and is warmer than the Red River Delta. In contrast to the rest of the country, these two areas feature relatively flat terrains and abundant supplies of surface water for irrigation—in fact seasonal flooding and inundation is a problem in both areas. In addition, low lying and coastal land in the Mekong Delta is subject to seasonal saltwater intrusion (see Tuong et al. 1991).

Broader characterization of the farming systems in the Mekong Delta can be drawn from examination of the survey and other data collected in the study. Appendix Table 1 summarizes a number of farm characteristics. Rice remains the dominant crop cultivated in the region and farming activities can be characterized as being focused on rice in most of the study area, but surveyed farms also reported cultivation of fruit tree and row crops (i.e., a wide variety of nonrice crops were reported including peanuts, cassava, cashews, dragon fruit, various vegetables, and sugarcane). In addition to crop cultivation, many surveyed farms (particularly farms with greater resources) raised poultry or small livestock. Moreover, many surveyed households reported off-farm work or engagement in micro-entrepreneurial activities (i.e., home-based light manufacturing or retailing activities). There is widespread hiring of nonfamily labor to assist in farm operations during peak periods of labor input demand (i.e., transplanting and harvest).

The pie charts superimposed on Figure 1 describe the evolution of cropping patterns across surveyed farms in the eight study villages. The figure also shows the broader land use patterns in the study area as mapped in 1996. These include fishery (fish or shrimp) and forestry activities on lands not well suited to crop cultivation (e.g., saltwater intruded). As indicated in the figure, farms in most

Figure 1. Land use in the Mekong River Delta



Source: Base land use map from V.Q. Minh, Soil Science Department, College of Agriculture, Can Tho University, Vietnam; villages, roads, and village-level land use trends by the author.

villages displayed increases in the intensity of land use over time, evolving from monocropping to double, or triple, cropping of their land. Coincident with the rise in multicropping over time, rice output per surveyed farm increased while the average level of rice produced per growing season fell. Subsistence production of rice among surveyed farms remains important, with just under half of the rice output going to home consumption on average across households and years of the survey, but the share of rice sold to the market increases across the years covered in the study.

In terms of the technology applied in agriculture in the study area, farms employ a blend of traditional and modern agricultural technology. For example, most still rely on water buffalo for plowing, but over 70 percent use modern seed varieties and there is widespread use of chemical fertilizers. There was also evidence of advancing adoption of modern technologies (e.g., use of motor tillers for plowing grew more common) over time.[3]

Surveyed farms were asked about the principal occupation of the household head, and more than 95 percent of the respondents indicated farming, with the remainder engaged in fishing, commerce, construction, or service occupations. Seasonal work off-farm as agricultural laborers is common among members of farming households cultivating only one or two crops per year. Individuals other than the household head were more likely to report off-farm work and to report work outside of agriculture (e.g., employment in construction or service jobs). Many farms reported receiving loans through the government agricultural credit program. However, information collected on these activities was uneven across surveyed villages.

Accessibility to markets appears to play a key role in determining the land use and rice cropping intensity adopted by farms. Accessibility indicators were calculated for the eight surveyed villages based on travel distances and travel times between single markets (the nearest local market to the farm and Ho Chi Minh City) and average distances/times for transport between the farm and all surrounding markets.[4] A mix of road and canal/river transport is used to transport production inputs and outputs in this area—depending upon the village and good involved—so distance and time measures can differ greatly. The study combined survey data with input from key informants knowledgeable about agricultural markets and distribution networks to generate estimates of travel time, and calculated travel distances along common routes using GIS. The paper measures accessibility from two perspectives—a supply perspective, (i.e., service areas from the point of view of a facility, such as the serviceable area of a tube well), and a demand perspective. Study estimates made use of accessibility measured from a demand perspective (i.e., the ease of reaching or accessing services, economic and social opportunities by a user, or how many markets are within a given travel time or travel effort). Particular emphasis was placed on the issue of

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[3] A more detailed review of environmental and socioeconomic conditions in the Mekong is provided in Edmonds et al. (2001).

[4] The average travel distance index D_i for an origin location i is the mean travel cost between the origin location (e.g. village) and a number (J) of target locations (e.g., markets):

$$D_i = \sum_{j-1}^{J} d_{ij} / J$$

where: D_i is the average distance (in kilometers) between farm i and the target market(s), and d_{ij} is the length/distance of the line segment k (in kilometers) between the village and market j.

physical accessibility as a measure of the degree of market integration and its influence on the economics of agricultural production.

Spatial economic models emphasize the importance of the spatial location of economic agents relative to market centers, economic infrastructure, and to one another in determining the economic activities pursued by the agents. They offer a good framework for considering the effects on land use of the biophysical characteristics and changes in such characteristics due to infrastructure development. Accessibility indicators included in the model are used to predict farmers' land use and production decisions. Survey and secondary data (official statistical and information generated using GIS used to characterize the demographic characteristics and resource endowments of surveyed farms, and to examine changes in agricultural and market development in the Mekong River Delta in the 1990s, are summarized in Appendix Table 1.

III. LAND USE MODEL

The model applies a von Thünen framework and builds on the work of Chomitz and Gray (1996) to examine the effect of travel distances between farms and markets on cropping patterns and land use intensity of farms.[5] Model formulation begins by assuming that farmers will use land for the activity that generates the highest rent given the physical characteristics of the plot (local climate, basis of land tenure, labor available for farming), and farm-gate input and output prices that depend upon the cost of transport. A revenue function for each alternative use of the plot can then be defined:

$$R_{ik}=P_{ik}Q_{ik}(P_{ik},C_{ik},Z_i)-C_{ik}X_{ik}(P_{ik},C_{ik})+u_{ik} \tag{1}$$

where R_{ik} gives the rent on plot/point i in use k
P_{ik} is the price of output/crop k at plot/point i (farm gate price of k)
Q_{ik} is the potential output of crop k at plot/point i (potential production)
C_{ik} is a vector of prices of inputs needed for production of crop k at plot/point i
Z_i is a vector of plot characteristics that determine its productive efficiency in crop k
X_{ik} is the optimal input level for production of crop k per unit at land at point i
u_{ik} is a random disturbance term

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[5] Von Thünen's (1826) original theory also explained nonagricultural land use, predicting that nonagricultural land would be from the center point around which land applied agriculture would be focused. The villages from which data for this study are drawn are all remote rural villages (the nearest is about 40 kilometers or 80 minutes away from Ho Chi Minh City) where land (aside from homesteads) was observed being applied exclusively in agriculture.

The farm gate prices of inputs and outputs in the revenue equation depend upon the distance of the farm from the market.[6] The model assumes that the net prices of inputs increase and the net prices farms can obtain for output decrease as farms move further away from markets.

A functional relationship between the level of input applied to farming and the amount of output produced by the farm is specified, wherein the level of output produced depends upon input levels, agroclimatic conditions, and other fixed land characteristics. Using the production function and the expressions for net revenue associated with cultivation of each crop, the relationships between the factors determining net revenue and production and the demand for inputs by the farm can be derived. The demand for inputs for crop *k* cultivated at location *i* is a function of the cost of the inputs, the farm gate price of the output, the characteristics of the plot, and the efficiency of production of crop *k* on the plot.

Using the expressions for input demand, production, and the effect of travel distances on revenues, an expression for the net returns associated with cultivation of crop *k* on parcel *i* that incorporates the effects of travel cost and the production technology of the farm is defined. Two travel distances are considered in the model. D_i is the distance between the homestead and the farming plot or plots operated by the family, and T_i is the average distance between the homestead and the input/output market(s) accessible to the farm. Both distances are relevant in the model since various inputs used in farming (e.g., labor, fertilizer, seed, etc.) and the outputs produced are transported between homesteads, farm plots, and markets over the course of a production season. The expression generates the hypothesis that the likelihood a plot will be applied to cultivation of a particular crop, and its intensity of use, will fall as the distance between the plot and the output/input market increases. At the extreme, very distant plots will not be cultivated, while plots located closest to markets are expected to be used for intensive commercial farming.

An expression for net revenue from cultivation of crop *k* on plot *i*, which is amenable to estimation from earlier equations can then be formed:

$$ln(R_{ik})=a_{0k}+a_{1k}ln(D_i)+a_{2k}ln(T_i)+a_{3k}ln(z_{1i})+a_{4k}ln(z_{2i})+\ldots+a_{Nk}ln(z_{Li})+u_{ik} \quad (2)$$

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[6] Land use and output levels can also be modeled as direct functions of prices, but reported prices do not reflect the costs incurred by remote farm households in procuring inputs or in marketing output—costs that strongly influence the net price perceived and considered by households in making their production and marketing decisions. The high incidence of subsistence farming and homogeneity in observed market prices for both common agricultural inputs and outputs across farms in the eight survey villages also makes use of prices implied by market distances preferable. For example, the coefficient of variation for the price of different grades of rice sold by surveyed farms ranged from 1.9 to 6.4 percent (also see standard deviations for prices reported on Appendix Table 1). Theoretical explanation of subsistence farming activity as a result of high transaction costs associated with remote rural markets can be found in de Janvry et al. (1991).

Adding technical assumptions concerning the distribution of error terms (uik) and the correlation of errors, the probability of any crop k being cultivated on plot i can be assumed to be distributed according to the multinomial logit distribution. This provides the basis for using the multinomial logit model in empirical tests of the model. If one is able to rank the alternative land uses—as is possible when the sample is limited to farms cultivating rice and the model is applied to explain rice cropping intensity—the model can be modified to take the form of an ordered logit model.

Under the model, the coefficients on distances (D_i and T_i) are expected to be negative, while those on productivity-enhancing land characteristics (s_{ik}) are expected to have a positive sign. The magnitude of the estimation coefficients will depend upon per unit costs of transportation of different crops and the relevance of a particular land characteristic to the production of a particular crop. Whether the crop being cultivated on the plot is destined for commercial or subsistence use will also affect the influence of distance on the likelihood that a particular crop is produced and its cropping intensity—subsistence crop production being less influenced by distance.

IV. ESTIMATION STRATEGY AND RESULTS

The model provides the basic framework applied in analyzing farm survey data, and establishes the multinomial logit and ordered probit estimators as appropriate for estimating land use and cropping intensity. The form of the estimation equation is given by equation (2) above. The key variables of interest in estimates are the distances between the homestead and the farming plots, and the distances between the homestead and markets accessible to the farm. The effect of farm accessibility to markets would be expected to have its greatest effect on commercial farm cultivation of perishable crops such as fruits or vegetables and the cropping intensity and inputs applied.

The exogenous or predetermined z variables in equation (2) are other household or farm characteristics expected to influence household land use decisions, and include characteristics of the biophysical environment where farms are located, family characteristics, and variables capturing market conditions in surveyed villages. Standard microeconomic production and supply analysis guide the selection of variables and expectations regarding their signs, but these are not reviewed in the interest of brevity. Different sets of right hand side variables are employed in estimates, depending upon the relevance of variables to the left hand side variable. In some estimates, the number of right hand side variables had to be reduced in order for the estimator to solve. These difficulties resulted from missing data and the relatively small sample size of the panel survey.

Data examined in this study draws from GIS data compiled by the International Rice Research Institute (IRRI) and collaborating research institutions in Viet Nam. Farm-level changes in rice output and land use are captured from a longitudinal household survey (1994–1997). The survey data were collected by the Institute of Agricultural Sciences of Vietnam (IAS) and Unité d'Economie

Générale, Faculté Universitaire des Sciences Agronomiques de Gembloux, Belgique, for a separate study of rice marketing channels in southern Viet Nam. In the estimates, data covering 149 farms from eight villages in three Mekong River Delta provinces are used. Because of nonreporting of some villages and to a lesser extent farm attrition from the survey, the sample size varies over time. Sampled villages represent a range of agroecological and production situations. Estimates use both cross-section and panel data-based estimation procedures. Panel data estimation procedures provide more robust estimates because they can account for the effect of unobserved variables and have the potential to measure more precisely the effect of changes in explanatory variables. The empirical analysis also uses cross-sectional data-based estimators for two reasons. Panel data estimators cannot accommodate the use of time-invariant right hand side variables in estimation equations, and many of the right hand side variables of interest were invariant or observed only a single time during the years of the survey.

In the estimates, cropping patterns and land uses are defined by cardinal rankings (e.g., monocropping, double cropping, etc.) and according to the type of crop cultivated. Crops are divided into broad categories: (i) rice; (ii) upland row crops (e.g., sugarcane, potato, vegetables); and (iii) fruit trees or perennial fruit crops (e.g., dragon fruit) or trees maintained by farms for fuel (e.g., eucalyptus). For ease in applying panel data estimators, it is useful to define cropping patterns and land use intensity as binary outcomes.

Appendix Table 2 reports the results of three estimations that used a random effects probit estimation procedure: (i) farm cultivation of nonrice crops, (ii) farm cultivation of fruit trees or other perennial crops, and (iii) cultivation of two or three rice crops per year. Because household-specific error terms are included in the models, the number of right hand side variables that could be considered in panel estimates was limited. The variables considered are: the on-farm land–labor ratio (acres per full-time equivalent family worker), age of household head, rice variety cultivated, and farm investment in dikes or land leveling. It is expected that households with lower land-labor ratios are more likely to farm land more intensively. Older farm operators and farmers with lower levels of educational attainment are expected to be more traditional and hesitant to adopt new technologies and cultivation of nontraditional crops. The rice variety planted by farms clearly influences the feasible cropping intensity. Dummy variables are used to define the seed variety cultivated by farms (e.g., short-duration modern varieties, long-duration traditional varieties).

Overall, the three models were each highly statistically significant. Several measures of the overall performance of the models in explaining land use are shown at the bottom of Appendix Table 2. Psuedo-R2 measures vary between 44.7 and 6.4 percent across measures and models. Lastly, the table reports land use categories correctly predicted by each model, and the distribution of actual versus predicted land use. All three models performed well in predicting farmland use decisions.[7]

The estimates of whether the farm cultivated a nonrice crop show that the land–labor ratio and the head of household's age both had statistically significant negative affects on farm cultivation of nonrice crops. Use of medium- or long-duration rice varieties and farm investments in water management infrastructure were found to increase significantly the likelihood of farm cultivation of a nonrice crop.[8] The estimated marginal effect of a one percent increase in the land–labor ratio of farms is a reduction of 4.0 percent in the likelihood that the farm cultivated more than a single crop per year. An increase of 10 years in the age of the household head was associated with only a 0.2 percent decrease in the likelihood the farm cultivated a nonrice crop. Farm use of medium- or long-duration modern rice was associated with an 8.4 percent increase in the likelihood the farm grew a crop besides rice. The signs of the estimation coefficients are consistent with the expected signs.

Farm-level investments in land leveling and water management were estimated to have a statistically significant effect on the likelihood that the farm cultivated tree crops, while older farm operators where significantly more likely to cultivate tree crops. Farms that invested in land leveling or other soil improvement or in water management infrastructure were, respectively, 35.9 and 30.6 percent less likely to cultivate a tree crop. The negative effect of the investments to improve the farm on tree crop cultivation is consistent with the understanding that such investments act as substitutes to tree crop cultivation in addressing water scarcity or poor soil quality.

Farms with a large amount of land per family worker were significantly less likely to cultivate three rice crops. A one percent increase in the land-to-labor ratio was associated with a 14.6 percent decrease in the likelihood of triple cropping. Farm use of medium- or long-duration varieties of rice was also found to have a positive statistically significant effect on the likelihood of triple cropping, although—surprisingly—use of short-duration varieties did not. Farms planting medium or long-duration varieties were 33.7 percent more likely to grow three crops of rice a year.

Summarizing results from land use estimates, farm size—particularly the relative abundance or scarcity of family agricultural labor in relation to the land operated by the farm—is found to play an important role in driving farmland use as expected. Farms with scarce labor relative to their farm size are less likely to cultivate land intensively. The choice of rice variety and corresponding crop maturation periods are closely related to broader land use choices of farms. Investments in farmwide and plot-level improvements in water management were also clearly linked to land use choices. One of the benefits of dike construction appears to be the opportunities it creates for farms to cultivate nonrice crops. In the absence of such investments, farms appeared to adopt land use options (i.e., fruit trees and other perennial crops) with greater immunity to the effects of poor water management. Lastly, the statistical significance of the estimation parameter *Rho* suggests that unobserved farm characteristics (e.g., farm operator knowledge and motivation, or land fertility traits) significantly influence land use choices. This underscores the complexity and idiosyncrasy of the land use choices of farms. The age variable included in the regression is highly correlated with farming experience; unfortunately other few variables were available to capture the characteristics that account for the significance of *Rho*.

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[7] The parameter *Rho* indicates the significance of farm specific error estimates. Because rice variety choice is endogenous with the choice of cropping pattern, estimates are open to endogeneity bias under the present specification. Unfortunately, data needed for suitable estimation procedures to control for endogeneity could not be identified.

[8] The random effects probit estimator is nonlinear, so estimation coefficients cannot be interpreted directly. The marginal effect of a change in a right hand side variable on the probability that a farm chose a particular land use at the mean values of the right hand side variables must be estimated using an approximation algorithm (see Greene 2003).

Measures of market accessibility and variables characterizing biophysical conditions in the surveyed villages used in estimates were fixed over time or observed at only a single point in time. This makes it impossible to examine the principal hypotheses of the model related to these variables using the panel estimators. Instead, cross-sectional estimates of cropping patterns and rice cropping intensity are used to estimate the effect of time invariant regressors. Rice cropping intensity is a categorical variable where the categories have a natural ordering, so an ordered probit estimator is used.

Rice cropping intensity estimates are significant overall in each of the four years, according to the goodness of fit measures reported on Table 1. Variables of particular interest in estimates are the measures of the distance between farming villages and the average travel time to all local markets, and the distance between homesteads and the plot or plots cultivated. The greater these distances, the lower the likely rice cropping intensity to be adopted by the farm. Estimation results generally support the model's hypotheses. Greater distances between farms and markets were associated with a reduced probability of intensive rice cultivation by the farm in 1995 and 1997, and estimated parameters were highly statistically significant. According to 1995 estimation results, a 10-minute increase in the average travel time between the farm and available local markets was associated with 14 and 21 percent decreases in the probability of cultivating two and three crops during the year, respectively. The distance between farms and local markets in 1996 had a positive and statistically significant effect on rice cropping intensity. This result appears to be related to the heavy rains and the sample of villages surveyed that year. The distance between plots and homesteads had a negative but not statistically significant effect on rice cropping intensity in 1995 through 1997.

Table 1. **Summary of Estimates of Rice Cropping Intensity**

Left-hand Side/Dependent Variable Estimation Coefficient (Estimated Standard Error)	**Rice Cropping Intensity**[a] **in 1994 (N = 60)**	**in 1995 (N = 114)**	**in 1996 (N = 114)**	**in 1997 (N=77)**
Constant	7.2873	–17.884***	16.599***	–34.870***
	(5.5589)	(4.217)	(4.678)	(11.088
Average distance between	0.0011	–0.131	–0.062	–0.025
homestead and plot or plots	(0.1183)	(0.138)	(0.139)	(0.185)
Average travel time to all	0.0323	–0.041	0.020***	–0.060***
accessible local markets	(0.0333)	(0.011)	(0.007)	(0.027)
Land–labor ratio on farm	0.0308	0.689	0.356	–0.100
(hectares/household laborer)	(0.9918)	(0.521)	(0.464)	(0.834)
Years since family settled in	0.0064	–0.007	–0.003	–0.012
current place of residence	(0.0110)	(0.007)	(0.007)	(0.014)
Maximum educational attainment	0.0020	0.311	0.071	0.526
of any family member	(0.5324)	(0.296)	(0.294)	(0.461)
Whether farm served by good-	2.2076	2.053***	4.266***	4.704***
quality water control system	(1.5133)	(0.466)	(0.843)	(1.668)
Annual precipitation at	–0.0091	0.013***	–0.011***	0.025***
locality where farm located	(0.0056)	(0.003)	(0.003)	(0.008)
Mu (1)	0.3267**	2.208***	1.801***	4.765**
	(0.1487)	(0.330)	(0.309)	(2.182)
Goodness of fit diagnostics:				
Pseudo R^2: Cragg-Uhler	0.432	0.633	0.521	0.768
Maddela	0.361	0.555	0.460	0.654
McFadden	0.248	0.386	0.288	0.556
Likelihood ratio (X^2) test	26.862***	92.256***	70.189***	81.707***
(degrees of freedom)	7	7	7	7
% correctly predicted	0.800	0.719	0.632	0.805
Actual/predicted	0 1 2 Tot.	0 1 2 Tot.	0 1 2 Tot.	0 1 2 Tot.
0	37 0 0 37	21 12 0 33	18 13 0 31	6 6 0 12
1	6 0 1 7	4 45 6 55	5 35 11 51	2 38 5 45
2	5 0 11 16	0 10 16 26	0 13 19 32	0 2 18 20
Total	48 0 12 60	25 67 30 114	23 61 30 114	8 46 23 77

[a] Model estimated using the ordered probit estimator.
[***] Estimated coefficient statistically significant at 99% confidence level
[**] Estimated coefficient statistically significant at 95% confidence level
[*] Estimated coefficient statistically significant at 90% confidence level.

The availability of low-saline irrigation water to farms had a positive and statistically significant effect on the intensity of land use in all estimates. The magnitude of the effect of high-quality irrigation on cropping intensity was much greater than the effects of other explanatory variables included in the model. Rainfall levels had mixed effects on the cropping intensity of surveyed farms. In years with normal to high rainfall, increased rain was associated with increased cropping intensity. Rains in 1996 were particularly heavy and higher rainfall in that year was associated with significantly reduced levels of cropping intensity among surveyed farms likely due to flooding problems associated with the heavy rains. Results show rice variety selection was clearly linked to cropping intensity, with the adoption of modern short-duration rice varieties enabling more intensive rice cultivation. Farm-level investments in land leveling or dike construction increased the likelihood that farms adopted intensive rice agriculture. Other variables such as the level of education in the household, the age of the household head, or the farming experience of the family did not have consistent statistically significant effects.

Rice production estimates explained most of the observed variation in the levels of rice output across surveyed farms. Results of production function estimates, which are used in the simulation model, are summarized in Appendix Table 3. All four models were highly statistically significant overall. Adjusted R^2 coefficient estimates across the production models ranged between 0.76 and 0.89. Cropping intensity had a consistent and statistically significant effect on annual production levels in all estimates. Monocropping was associated with significantly lower levels of output and triple cropping was associated with significantly higher output levels compared to double cropping. The land area cultivated and the amount of rice seed used were also associated with significantly higher levels of output in all estimates. The amount of hired labor applied on the farm had a positive and statistically significant effect on output in all the estimates except the 1994 cross-sectional estimate. The level of fertilizer applied on the farm had a positive and statistically significant effect on rice output in 1996 and 1997. The amount of family labor applied on-farm was difficult to measure accurately from available data, but had a negative and significant effect on rice output in 1994 and a positive and significant effect in 1995. Pesticide application had a positive and statistically significant effect on output only in 1994.

The signs of these estimated coefficients largely conform to expectations. One exception involved the use of modern varieties, which had inconsistent effects on rice production across estimates. It had statistically significant negative effects in estimates carried out using data from 1995 and 1997 and a positive effect in 1996. One possible explanation for this is that the variable was imprecisely defined due to aggregation across many distinct varieties. A second reason is that due to collinearity with rice cropping intensities, the principal effect of modern variety use seems to have been to enable farms to pursue more intensive rice production. Considered together, the various estimates provide a clear indication of the factors driving farmland use, production, and marketing decisions.

V. SIMULATION MODEL FOR EVALUATION OF INVESTMENTS

The implications of model estimates for evaluating the effect of development of different types of infrastructure can be better understood by generating a simulation model using estimation parameters. The results of a simulation model derived from empirical estimates are summarized in Tables 2 and 3. Table 2 shows the distribution of rice cropping intensities among surveyed farms. The actual distribution of farms in each of the four years of the survey is shown, along with the projected distribution under alternative scenarios.

Table 2. **Simulation of Effects of Investments on Distribution of Farm Rice Cropping Intensity**

Rice Cropping Intensity	Actual Distribution of Farms				Simulated Distribution of Farms with Improvements in											
					Transportation System—Reducing Travel to Market by 10 Minutes				Land Consolidation—Reducing Distance from Home to Plot by 1 Kilometer				Water Control Infrastructure—Increasing Area Covered by 10%			
	1994	1995	1996	1997	1994	1995	1996	1997	1994	1995	1996	1997	1994	1995	1996	1997
Monocropping	37	33	31	12	36	21	26	12	40	29	33	12	15	13	0	12
Double cropping	7	55	51	45	7	62	51	45	6	57	51	44	8	67	52	38
Triple cropping	16	26	32	20	17	31	37	20	14	28	30	21	37	34	62	27

Table 3. **Simulation of Effects of Infrastructure Investments on Rice Production (in tons) among Surveyed Farms**

	Actual Production[a]				**Predicted Production for Travel to Market (–10 min)**[a]				**Predicted Production for Distance from Home to Plot Reduced by 1 km**[a]				**Predicted Production for Better Water Management Extension +10%**[a]			
	1994	**1995**	**1996**	**1997**	**1994**	**1995**	**1996**	**1997**	**1994**	**1995**	**1996**	**1997**	**1994**	**1995**	**1996**	**1997**
1 × rice farm production	25	22	11	7	24	14	10	7	27	20	12	7	10	9	0	7
2 × rice farm production	5	41	24	28	5	47	24	28	5	43	24	28	6	50	24	24
3 × Rice Farm Production	13	22	26	16	14	26	30	16	12	23	25	17	31	28	51	21
Total rice production	44	85	61	51	44	86	64	51	43	86	60	51	47	87	75	52
Percent change in total production		0.4	3.0	5.2	0.0	–0.9	1.0	–2.1	0.4	7.6	4.9	31.5	2.6			

[a] Columns may not sum to total rice production due to rounding error.

One scenario involves improvements in travel networks between surveyed villages and local markets. The second considers the effect of land transport improvements or land consolidation that brings homesteads and farm plots closer. The third contemplates extension of water control infrastructure to an additional 10 percent of the surveyed farms. Using results of production function estimates, the implied changes in the share of farms that double- or triple-crop rice can be applied to calculate an implied increase in aggregate rice output across farms. The production estimates provide a measure of the average change in annual rice yield associated with mono, double, or triple cropping of rice. Table 3 details the changes in total rice production under the various scenarios. The simulation model shows a large effect of investments in irrigation extension on rice production, and more moderate effects obtained from improvements in the transportation system or land consolidation.

VI. CONCLUSION

Research results generally support the hypothesis that the time and direct cost of transporting inputs and outputs between rural homesteads, farm plots, and markets influence the land use and production decisions of farming households. Estimation results confirm expectations that greater transport distances reduce cropping intensity and make the cultivation of nonrice crops less likely. However, results suggest the quality of water management infrastructure is more important than transport infrastructure in determining land use. The magnitude of the effect of having high-quality water management infrastructure dwarfed the effect of other variables. Other variables including the use of modern seed varieties, age of the farm operator, land-to-labor ratio of the farm, and rainfall influenced farmland use as predicted. Results suggest that investments in water management offer more promise in improving farmland use options and increasing rice production than transport infrastructure investments in the Delta. However, information on the relative costs of extending road and water management infrastructure is necessary before it would be appropriate to offer policy conclusions in this regard. This study relied on existing sources of data originally collected for a study of the rice production and marketing chain in Viet Nam, and as a result encountered considerable data constraints in analyses.

Appendix Table 1. **Sample Means from Data Set Used in Study**

Variable	Units	1994 (N=89) Mean	1994 (N=89) S.D.	1995 (N=149) Mean	1995 (N=149) S.D.	1996 (N=122) Mean	1996 (N=122) S.D.	1997 (N=105) Mean	1997 (N=105) S.D.	All Years Min.	All Years Max.
Number of Reporting Villages		6 of 10		10 of 10		8 of 10		9 of 10			
Household Demographic Characteristics											
Years since family settled in area[a]	years					42.3	19.2			1	85
Age of the head of household[a]	years					53.0	15.4			21	85
Most educated HH member–primary[a]	0/1 dummy					0.33	–			0	1
Most educated member–secondary[a]	0/1 dummy					0.58	–			0	1
Most educated member–postsecondary[a]	0/1 dummy					0.04	–			0	1
Total persons residing in household	individuals	4.7	1.52	5.8	1.79	5.8	1.71	5.6	1.66	2	13
Land/labor ratio in household	has./workers	0.36	0.31	0.40	0.52	0.34	0.45	0.40	0.48	0	3.96
Landholding and Biophysical Characteristics											
Total land owned by farm	hectares	0.91	0.63	1.22	0.79	1.15	0.70	1.07	0.64	0.13	4
Farming plots cultivated by family	number	1.3	0.69	1.5	0.79	1.1	0.45	1.0	0.10	1	5
Quality adjusted landholding size	quality adj. has.	1.14	1.11	1.47	1.92	1.30	1.81	1.34	1.91	0.04	17.84
Alluvial soil[b]	0/1 dummy					0.51	–			0	1
Medium-slightly acid sulfate soil[b]	0/1 dummy					0.10	–			0	1
Saline soils w/dry season saltwater[b]	0/1 dummy					0.21	–			0	1
Rice Production, Marketing, and Land Use											
Paddy yield during winter-spring	kilos/hectare	3841	1382	5288	1490	5670	1073	5023	1377	1053	9000
Area cultivated to rice autumn-winter	hectares	0.88	0.55	1.00	0.61	0.92	0.62	0.79	0.41	0.13	3.5
Total yearly rice production in province	1000 metric tons	–	–	10529	5430	13792	3615	11539	5939	0	18032
Rice cropping intensity	number	1.8	0.79	1.9	0.69	1.9	0.76	2.1	0.58	0	3
Cultivated nonrice/nonrow crop	0/1 dummy	0.12	–	0.55	–	0.59	–	0.56	–	0	1
Paddy sold by farm during year	kilos	–	–	5459	5901	5541	5486	5405	5106	0	32060
Average sale price of paddy during year[c]	1997 $US/kilo	0.13	0.03	0.17	0.04	0.14	0.02	0.15	0.02	0.09	0.30
Average local market paddy price during year	1997 $US/kilo	0.14	0.01	0.18	0.02	0.15	0.01	0.14	0.01	0.12	0.20

Agricultural Technology, Practices, and Inputs											
Traditional nonglutinous rice	0/1 dummy	0.18	–	0.11	–	0.11	–	0.07	–	0	1
Modern short duration nonglutinous	0/1 dummy	0.20	–	0.35	–	0.37	–	0.43	–	0	1
Modern medium/long duration nonglutinous	0/1 dummy	0.52	–	0.40	–	0.34	–	0.24	–	0	1
Urea per hectare, year average	kilos/hectare	160	87	160	74	169	71	149	73	0	533
Price of urea, weighted yearly average	1997 $US/kilo	0.244	0.028	0.236	0.022	0.248	0.016	0.196	0.023	0.123	0.337
Local market price urea, yearly average	1997 $US/kilo	0.355	0.009	0.302	0.005	0.232	0.014	0.187	0.005	0.175	0.369
No mechanized tractor used[a]	0/1 dummy					0.28	–			0	1
Whether homestead w/ drying court[a]	0/1 dummy					0.26	–			0	1
Water Management Infrastructure (water)											
Land leveling carried out on farm	0/1 dummy	0.38	–	0.28	–	0.29	–	0.38	–	0	1
Dike constructed by farm	0/1 dummy	0.48	–	0.36	–	0.34	–	0.39	–	0	1
Interpolated annual rainfall at village	millimeters	1251	66	1616	216	1863	107	1513	145	1174	2076
Flooding 0.5-1 m. lasting 3 months[b]	0/1 dummy					0.12	–			0	1
Brackish (>4g/l) water > 6 months[b]	0/1 dummy					0.13	–			0	1
Rainfed farm (no irrigation)[b]	0/1 dummy					0.11	–			0	1
Limited irrigation available[b]	0/1 dummy					0.10	–			0	1
Reliable irrigation on farm[b]	0/1 dummy					0.61	–			0	1
Market Accessibility and Travel Distances											
Distance to nearest local market[b]	kilometers					19.8	4.6			12	28
Accessibility index distance nearest market[b]	kilometers					19.5	4.7			11	28
Accessibility index time, all local markets[b]	minutes					130.2	70.2			51	255

Note:

[a] Figures reported come from: (i) a baseline survey that did not include all households later interviewed for the longitudinal survey, and (ii) from interpolation or overlay of values generated from GIS coverages. Number of observations for particular variables can vary from general sample sizes reported.

[b] Soil, water availability, and accessibility measures were derived from GIS coverages available in Mekong Delta provinces only.

[c] Calculated as the weighted average (by quantity of rice sold) sale price of rice reported by surveyed farms.

Appendix Table 2. **Summary of Estimates of Land Use (panel data estimators)**

LHS/Dependent Variable Estimation Coefficient (Standard Error of Estimate)	**Cultivates Nonrice Crop(s) 1994–7 (N=436)**	**Farm Cultivation Fruit/Other Trees 1994–7 (N=436)**	**Farm Triple Crops Rice (vs. 2 rice) 1994–7 (N=354)**
Land-labor ratio on farm	-1.058 *	0.056	-0.365 ***
(hectares per household laborer)	0.578	0.591	0.153
Age of the household head	-0.050 ***	0.014 **	-0.003
	0.014	0.007	0.002
Cultivated short duration modern	-0.131	-0.018	0.088
varieties of rice	0.670	0.452	0.156
Cultivated medium- or long-duration	2.221 ***	-0.334	0.846 ***
modern rice varieties	0.775	0.364	0.172
Farm invested in land leveling or other	-0.116	-0.902 **	0.068
soil improvement	0.467	0.450	0.148
Farm invested in dike construction or other	0.646 *	-0.769 *	0.080
water management	0.381	0.449	0.149
Rho	0.787 ***	0.970 ***	0.812 ***
	0.225	0.081	0.125
Goodness of fit diagnostics:			
Pseudo R^2: Cragg-Uhler	0.130	0.447	0.117
Maddela	0.064	0.317	0.079
McFadden	0.098	0.309	0.073
Likelihood ratio (X^2) test	28.693 ***	166.549 ***	35.846 ***
[degrees of freedom]	1	1	1
Pct. correctly predicted	0.842	0.672	0.624

Actual/Predicted	0	1	tot.	0	1	tot.	0	1	tot.
0	342	17	359	107	126	233	136	39	175
1	52	25	77	66	137	203	94	85	179
total	394	42	436	173	263	436	230	124	354

Note: Estimates carried out using the random effects probit estimator for panel data.
***Estimated coefficient is statistically significant at a 99% confidence level.
**Estimated coefficient is statistically significant at a 95% confidence level.
*Estimated coefficient is statistically significant at a 90% confidence level.

Appendix Table 3. **Rice Production Estimates (cross sectional estimators)**

LHS/Dependent Variable	**Rice Production**			
Estimation Coefficient (Estimation Standard Error)	**in 1995[a] (N=117)**	**in 1996[a] (N=134)**	**in 1997[a] (N=121)**	**1995-97[b] (N=372)**
Constant(s)	7.493 ***	4.642 ***	6.295 ***	N.R. ***
	0.322	0.765	0.350	N.R.
Single-cropped rice	-1.281 ***	-3.479 ***	-1.947 ***	-0.416
	0.253	0.469	0.271	0.453
Triple-cropped rice	0.608 ***	1.570 ***	0.972 ***	-0.015
	0.132	0.257	0.130	0.226
Largest area planted to rice	0.789 ***	0.469 ***	0.558 ***	1.090 ***
in any season	0.075	0.194	0.070	0.254
Total household expenditure	0.067	0.483 ***	0.098 ***	0.210 ***
on hired labor	0.081	0.077	0.029	0.052
Imputed value of family	-0.194 **	0.429 ***	0.102	0.176
labor applied on farm	0.097	0.165	0.098	0.127
Expenditure on fertilizer	0.029	0.205 *	0.151 **	0.033
	0.060	0.108	0.068	0.072
Expenditure on pesticides	0.096 ***	0.010	0.016	-0.320
or herbicides	0.038	0.075	0.034	0.048
Average quantity of rice seed	0.622 ***	0.735 ***	0.747 ***	-0.419 **
used per season cultivated	0.125	0.236	0.101	0.192
Use of any modern variety	-0.123 *	0.226 *	-0.119 **	0.295
of rice seed	0.067	0.134	0.058	0.092
Year 1995	–	–	–	-0.010
	–	–	–	0.069
Year 1996	–	–	–	-0.103 ***
	–	–	–	0.063
Goodness of fit diagnostics				
Adjusted R^2	0.892	0.755	0.888	0.835
F-ratio	107.710 ***	46.450 ***	106.220 ***	12.210 ***
[degrees of freedom]	[9, 107]	[9, 124]	[9, 111]	[167, 204]
Likelihood ratio (X^2) test	270.097 ***	197.658 ***	273.827 ***	891.838 ***
[degrees of freedom]	[9]	[9]	[9]	[167]

Note: N.R. means household-specific intercepts are not reported.

[a] Estimated in logarithms using the ordinary least squares estimator.

[b] Estimated in logarithms using the fixed effects estimator for panel data. The results of the Hausman test (46.950*** with 11 d.f.) supported use of the fixed effects specification.

*** Estimated coefficient statistically significant at a 99% confidence level.

** Estimated coefficient statistically significant at a 95% confidence level.

* Estimated coefficient statistically significant at a 90% confidence level.

REFERENCES

Chomitz, K., and D. Gray, 1996. "Roads, Land Use, and Deforestation: A Spatial Model Applied to Belize." *World Bank Economic Review* 10(3):487-512.

de Janvry, A., M. Fafchamps, and E. Sadoulet, 1991. "Peasant Household Behavior with Missing Markets: Some Paradoxes Explained." *Economics Journal* 101:1400-17.

Edmonds C. M., S. P. Kam, H. C. Viet, and L. Villano, 2001. "Land-use Dynamics and Changes in Rice Production in the Mekong Delta in the 1990s: An Econometric Analysis using Longitudinal Household Survey Data." In S. Peng and B. Hardy, eds., *Rice Research for Food Security and Poverty Alleviation.* Proceedings of the International Rice Research Conference, 31 March–3 April 2000, International Rice Research Institute, Los Baños, Philippines.

Greene, W. H., 2003. *Econometric Analysis.* 5th ed. New Jersey: Prentice Hall.

Institute of Agricultural Sciences, 1997. "Competitiveness of Rice Channel in Mekong Region: Study Report 1994, 1995, 1996." Research report of the Competitiveness of Rice Production in the Mekong River Delta Project, Institute of Agricultural Sciences, Ho Chi Minh City, Viet Nam.

Minot, N., and F. Goletti, 1998. "Export Liberalization and Household Welfare: The Case of Rice in Vietnam." *American Journal of Agricultural Economics* 80:738-49.

Pingali, P. L., and V. T. Xuan, 1990. Vietnam: Decollectivization and Rice Productivity Growth. IRRI Social Sciences Division Papers No. 89-16, International Rice Research Institute, Los Baños, Philippines.

Tuong, T. P., C. T. Hoanh, and N. T. Khiem, 1991. "Agro-hydrological Factors as Land Qualities in Land Evaluation for Rice Cropping Patterns in the Mekong Delta of Vietnam." In P. Deturck and F. M. Ponnamperuma, eds., *International Rice Production on Acid Soils in the Tropics.* Institute of Fundamental Studies, Kandy, Sri Lanka.

von Thünen, J. H., 1826. *Der isolierte Staat.* In C. M. Wartenberg, trans. and P. Hall, ed., *Isolated State* (in English, 1966). Oxford, New York: Pergamon Press.

Economic Growth, Poverty, and Inequality in Indian States in the Pre-reform and Reform Periods

N.R. BHANUMURTHY AND ARUP MITRA

The paper assesses the impact of economic reforms on poverty incidence by decomposing the change in poverty ratio into growth/mean effect, inequality effect, and population shift effect for the rural and urban areas of 15 major states and at the all-India level. Using National Sample Surveys, data were analyzed for two time periods: (i) 1983 to 1993/4 and (ii) 1993/4 to 1999/2000, broadly representing the pre-reform and reform period, respectively. The growth/mean effect dominates in both periods over the inequality effect and the population shift effect. The growth effect, which is beneficial for poverty reduction, seems to have gone up in the reform period. The adverse inequality effect also fell during the reform period. States with a greater beneficial growth effect in the reform period also show a fall in the magnitude of an adverse population shift effect in the urban areas, i.e., a relatively smaller increase in the incidence of urban poverty caused by rural–urban migration.

I. INTRODUCTION

Pro-market economic reforms are expected to simultaneously accelerate economic growth and at the same time help an economy recover from foreign exchange crises and fiscal imbalances. This is obviously not expected to affect different sections of the population uniformly. One view is that the poor may benefit from economic growth only indirectly and, hence, the proportional benefits of growth going to the poor could be always less than those accruing to the nonpoor. In other words, the positive effects of growth on the poor tend to get offset by the adverse effects of rising inequality emerging, as suggested by Kuznets (1955), in the process of economic growth in the initial stages. However, if economic growth is accompanied by a decline in inequality, the poor benefit

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more than the nonpoor—a situation described in the literature as pro-poor growth (see Kakwani et al. 2000, Kakwani and Pernia 2000). Even when inequality rises, observed poverty may still decline if the growth effect predominates over the inequality effect, that is, the extent of fall in poverty due to growth is larger than the rise in poverty due to a rise in inequality.

In the Indian context with its wide regional variations in terms of socioeconomic development, economic reforms have been initiated at different levels across states. Most of the economic reforms have been pursued in the industrial sector, the spread and growth of which show considerable regional variations. Availability of infrastructure, which is a strong determinant of industrial productivity and competitiveness on one hand, and occupation, mobility, and earnings of the population on the other, also varies significantly across states (Mitra 1997). As an outcome of this it is expected that economic growth would have wide regional variations; further, the changing income distribution in the process of growth would also be different across states. Hence, it would be interesting to delineate the effects of growth and inequality on poverty in different states. This could be done for the pre-reform and reform periods so as to identify the changes that can be attributed to economic reforms.

Population mobility is an outcome of economic growth too. The spatial composition of growth reflected in terms of rural–urban development disparity motivates people to shift to areas with better employment prospects. As total poverty is a weighted average of rural- and urban-specific poverty ratios, the net effect of population mobility on poverty depends on the changes in its rural and urban components. Since economic reforms are more urban-based, the spatial composition of growth is expected to change, resulting in a migration of population from rural to urban areas. The decline in the incidence of poverty (rural–urban combined) depends on whether urban employment opportunities are large enough to absorb the increasing supplies of labor from the rural areas. A large number of empirical studies exist to suggest that rural migrants have been able to escape poverty though they could not graduate to the urban formal sector (Banerjee 1986, Mitra 1994, and Papola 1981). Even when the incidence of urban poverty rises due to rural–urban migration, the decline in the combined poverty ratio may be evident with a fall in the rural poverty incidence occurring in response to out-migration. This is precisely because the weight of urban poverty is much less for combined poverty compared to rural poverty.

Keeping in view these outcomes in the process of economic growth, this paper makes an attempt to decompose the change in poverty over two time points in terms of pure growth effect (holding inequality constant), inequality effect (holding growth constant), and population shift effect. Such an analysis enables a critical analysis of the policy issues and offers a deeper understanding of the reform process. However, it may be noted that in doing such an exercise only the expenditure inequality has been considered, which is a gross underestimate of income/asset inequality. Similarly the growth effect is envisaged in terms of mean effect—the mean of consumption expenditure per capita—which is again a gross underestimate of per capita income. As data on income and its distribution is not available, these crude proxies are followed based on the National Sample Survey data on expenditure per capita and its size distribution. In assessing the population shift effect the percentages of population residing in urban and rural areas are considered, which in addition to rural–urban migration includes also the differentials in rural–urban natural growth of population, and the rise (fall) in the level of urbanization (percentage of rural population) due to reclassification of areas. Hence, it may not be justified to perceive the population shift effect purely in terms of rural–urban migration, which can again comprise interstate as well as intrastate streams not deciphered in this study. While interpreting the results, these limitations, therefore, need to be kept in view.

The organization of the paper is as follows. The next section presents the analytics of the decomposition exercise, based on the methodology of Mazumdar and Son (2002). Section III analyzes the results of the decomposition exercise and brings out the regional variability in the mean effect, inequality effect, and population shift effect. Section IV summarizes the major findings.

II. TECHNICAL FRAMEWORK

Several studies in the Indian context have been pursued to assess the impact of economic growth on poverty. Ahluwalia (1978) cited evidence in favor of agricultural growth trickling down to benefit the poor in rural India. Jain and Tendulkar (1990) examined the relative strengths of growth and redistribution in changing the headcount ratio of poverty over the period 1970/1 to 1983. Mitra (1992) showed that the impact of industrial growth on urban poverty was only nominal, which was reconfirmed by Ravallion and Datt (1996) in the case of rural as well as urban areas. Overall, the debate around growth and poverty seems to have arrived at a consensus that growth is necessary, but not sufficient, for poverty reduction. Growth is said to be pro-poor "when it is labor absorbing and accompanied by policies and programs that mitigate inequalities and facilitate income and employment generation for the poor, particularly women and other traditionally excluded groups" (ADB 1999). It is defined as what enables the poor to actively and directly participate in and significantly benefit from economic activity (Kakwani and Pernia 2000). Chen and Ravallion (2000), for instance, have argued that continuing poverty in many countries is the result of persistent inequalities—both economic and non-economic—that prevented the poor from participating in the growth that did occur. Hence, a strategy that is biased in favor of the poor to enable them to benefit proportionally more than the rich needs to be the basis of pro-poor growth (Kakwani and Pernia 2000).

Decomposing the change in the poverty index into a growth and distribution effect was initiated by Kakwani and Subbarao (1990) and Jain and Tendulkar (1990) while quite a few alternative decomposition methods have been developed subsequently, for example by Datt and Ravallion (1992), Kakwani (2000), and Mazumdar and Son (2002). A synthesis of these methods is given below.

Let the change in poverty between two periods *j* and *k* be ΔP_{jk} and the incidence of poverty be

$$P = P(Z, \mu, L(t)) \tag{1}$$

where *P* is the poverty ratio, *Z* is the poverty line, μ mean income (or expenditure), and *L*(*t*) the Lorenz ratio.

The change in poverty can be defined as

$$\Delta P_{jk} = Q(M_{jk}, I_{jk}), \tag{2}$$

where M_{jk} and I_{jk} are change in poverty due to mean and inequality effect, respectively. Kakwani and Subbarao (1990) estimated M_{jk} by taking the change in mean and keeping Lorenz curve of the j^{th} period constant. I_{jk} has been estimated by taking the change in Lorenz curve and keeping mean of the j^{th} period constant. But this decomposition was not an exact one and contains the residual term. Datt and Ravallion (1992) have defined this residual term as

$$\varepsilon_{jk} = -M_{kj} - M_{jk} \tag{3}$$

This decomposition is not symmetric as it is sensitive to the reference period.

Another method suggested by Jain and Tendulkar (1990) defines that the change in poverty can be decomposed as

$$\Delta P_{jk} = M_{jk} + I^{*}_{jk} \text{ and } \Delta P_{jk} = M^{*}_{jk} + I_{jk}$$

where

$$M^{*}_{jk} = P(Z, \mu_k, L_k(t)) - P(Z, \mu_j, L_k(t)) \text{ and}$$
$$I^{*}_{jk} = P(Z, \mu_k, L_k(t)) - P(Z, \mu_k, L_j(t))$$

Though this procedure is an exact one, this was criticized on the ground that the mean effect and the inequality effect have been estimated by using a different reference period.

Kakwani (2000) tries to propose a method that takes care of the weaknesses that are found in the previous ones. Kakwani defines the mean and inequality effect as

$$M^{*}_{jk} = \frac{1}{2}\left[P(Z,\mu_k,L_j(t)) - P(Z,\mu_j,L_j(t)) + P(Z,\mu_k,L_k(t)) - P(Z,\mu_j,L_k(t))\right] \qquad (4)$$

and

$$I^{*}_{jk} = \frac{1}{2}\left[P(Z,\mu_j,L_k(t)) - P(Z,\mu_j,L_j(t)) + P(Z,\mu_k,L_k(t)) - P(Z,\mu_k,L_j(t))\right] \qquad (5)$$

Hence the decomposition would be written as

$$\Delta P_{jk} = M^{*}_{jk} + I^{*}_{jk} \qquad (6)$$

In addition to the growth and inequality effect, Mazumdar and Son (2002) included the population shift effect in the decomposition exercise.

Assuming that there are two demographic groups as i=1 and 2, the change in poverty can be expressed as

$$\frac{\Delta P}{P} = \sum_i \frac{\overline{f_i P_i}}{P}\frac{M_i}{P_i} + \sum_i \frac{\overline{f_i P_i}}{P}\frac{I_i}{P_i} + \sum_i \frac{\overline{P_i f_i}}{P}\frac{\Delta f_i}{f_i} \qquad (7)$$

where f_k and P_k are population share and poverty index of the k^{th} group, respectively,

and $\overline{f}_i = \dfrac{f_{ij} + f_{ik}}{2}$, $\overline{P}_i = \dfrac{P_{ij} + P_{ik}}{2}$

where

f_i and P_i - population share and poverty index of the i^{th} group, respectively

$\overline{f}_i$ and $\overline{P}_i$ - i^{th} group averages of the respective values at two time points

P - headcount ratio of poverty for all areas (rural and urban combined)
ΔP - change in poverty between two time points
Δf_i - change in population share between two time points of the ith group
I - rural and urban areas

The third term on the right hand side represents the change in poverty due to population shift.

It may be noted that M and I are mean and inequality effect, respectively, similar to that of M^* and I^* of Kakwani (2000), and this is an exact decomposition of the change in percentage of poverty.

In the present study, equation (7) is estimated to decompose the change in the incidence of poverty in terms of mean effect, inequality effect, and effect due to population shift from rural to urban areas.

Equality, as defined by Tendulkar and Jain (1995), is an unambiguous reduction in poverty as well as an increase in social welfare. However, to judge distributional outcomes entirely on the basis of relative inequality, i.e., in terms of a reduction in the Gini coefficient, could be faulty. This is because the same Gini coefficient can be associated with different Lorenz curves reflecting very different kinds of relative inequalities. Similarly, a simple headcount measure of poverty or the poverty gap index is actually the special case of the Foster-Greer-Thorebecke (1984) poverty index, which captures the severity of poverty. Hence, limitations of the analysis arising from the fact that the headcount measure of poverty is used and that the inequality index implicit in the analysis refers to Gini coefficient, need to be kept in mind while interpreting the results. Further, as the methodology adopted here is an exact decomposition, the inequality effect is derived as a residual after estimating growth effect and population shift effect from the change in poverty incidence.

III. DATABASE

This study decomposes the changes in poverty over two periods, i.e., 1983 to 1993/4 and 1993/4 to 1999/2000, for two regions, i.e., rural and urban, in 15 major Indian states and also at the all-India level using the decomposition methodology developed by Kakwani (2000) and Majumdar and Son (2002). The distribution of consumer expenditure data from the 38th, 50th, and 55th rounds of Consumer Expenditure surveys conducted by the National Sample Survey Organisation for 1983, 1993/4, and 1999/2000 respectively are used for comparison.[1] Also, the base year expenditures have been adjusted according to the prices in the terminal year. The price indices used are state-specific price deflators for rural and urban areas, which were used in the modified expert group methodology to update the poverty line of Rs49 and Rs56.6 in 1973/4 prices for rural and urban areas, respectively (Planning Commission 2002). The distribution of expenditure class intervals in each round is different. The base year expenditure class intervals have been reclassified in terms of terminal year class intervals. In doing so, it is assumed that the number of persons and the per capita expenditure within the class interval are proportionately related. Population for the three periods is interpolated based on population census data for 1981, 1991, and 2001.

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[1] Strictly speaking the results from 55th round data on consumption expenditure are not comparable with the earlier rounds because of the possible intermingling of responses due to

IV. EMPIRICAL ANALYSIS

At the all-India level, the decline in poverty incidence in the 1990s (1993/4 through 1999/2000, period 2 hereafter) is higher than during 1983 to 1993/4 (period 1 hereafter). The rural–urban differences are noteworthy: rural poverty dropped by a little more than 10 percentage points in period 2, whereas it was around 8.3 percentage points in period 1, and urban poverty fell by 8.38 and 8.74 percentage points in periods 1 and 2, respectively (see Table 1). At the state level, except for Assam and Haryana, all the other states registered a fall in the incidence of rural poverty in the 1980s, and in the 1990s each of the major states recorded a decline. In the case of urban areas except Andhra Pradesh and Orissa in the 1980s and 1990s, respectively, all the other states show a decline in the incidence of poverty. However, the extent of decline varies considerably across states though in the rural areas it seems to have fallen in the 1990s compared to the 1980s: the coefficient of variation of the change in rural poverty dropped from 98.75 in the first period to 51.03 in the second period. On the other hand, the coefficient of variation increased from 61.58 to 70.21 in the urban areas of the states during the same period indicating a rise in the interstate variations of change in the incidence of urban poverty in the reform period.

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adoption of dual recall periods (7 days and 30 days) in the 55th round. For details see Deaton and Dreze (2002) and Sundaram (2001).

Table 1. **Change in Poverty Incidence in the 1980s and 1990s**

	Rural Poverty		Urban Poverty		All Areas	
States	**1980s**	**1990s**	**1980s**	**1990s**	**1980s**	**1990s**
Andhra Pradesh	-10.61	-4.87	2.03	-11.7	-6.72	-6.42
Assam	2.41	-4.97	-14	-0.26	0.39	-4.77
Bihar	-6.16	-13.91	-12.83	-1.59	-7.26	-12.36
Gujarat	-7.62	-9.01	-11.25	-12.3	-8.58	-10.14
Haryana	7.46	-19.75	-7.77	-6.39	3.68	-16.31
Karnataka	-6.45	-12.5	-2.68	-14.89	-5.08	-13.12
Kerala	-13.27	-16.38	-21.13	-4.28	-14.99	-12.71
Madhya Pradesh	-8.26	-3.58	-4.68	-9.94	-7.26	-5.09
Maharastra	-7.3	-14.21	-5.11	-8.34	-6.58	-11.84
Orissa	-17.81	-1.71	-7.51	1.19	-16.73	-1.41
Punjab	-1.25	-5.6	-12.44	-5.6	-4.41	-5.61
Rajastan	-7.04	-12.72	-7.45	-10.64	-7.05	-12.13
Tamil Nadu	-21.51	-11.93	-7.19	-17.66	-16.63	-13.91
Uttar Pradesh	-4.17	-11.06	-14.43	-4.5	-6.22	-9.7
West Bengal	-22.25	-8.95	-9.91	-7.55	-19.19	-8.64
India	-8.38	-10.18	-8.43	-8.74	-8.51	-9.87

Note: The 1980s covers the pre-reform period between 1983 and 1993/4; the 1990s covers the reform period between 1993/4 and 1999/2000. The change is indicated in terms of the terminal year figure minus the base year figure.

It is assumed that as economic reforms are likely to bring in higher growth, the growth or mean effect is expected to go up in period 2. Though the extent of fall in the incidence of urban poverty in the 1990s has been only marginally higher than that in the 1980s as noted above, the hypothesis of a higher growth or mean effect in period 2 may still be valid. In addition to this, the inequality effect might have fallen in period 2 compared to period 1 if economic reforms aim at generating pro-poor growth, that is, employment generation occurring in the process of economic growth (Kakwani and Pernia 2000). Further, as the coefficient of variation of the change in the incidence of urban poverty rose in the 1990s over the 1980s it can be hypothesized that the economic reforms executed at different levels across states have generated different mean and/or inequality effects.

From Table 2 it may be noted that the growth/mean effect dominated over the inequality effect as well as the population shift effect in most of the states during period 1, which brought in a decline in the observed poverty ratio. Even in rural Assam and Haryana, where the observed poverty ratio actually increased in period 1, the growth effect mainly accounted for this rise. However, in urban Andhra Pradesh, the rise in observed poverty has been caused by all the three components: growth, inequality, and population shift. In fact the population shift effect turns out to be slightly higher than the growth effect. In all the other states, a decline in the observed poverty incidence in the rural and urban areas is mainly attributed to the growth effect.

Though the inequality effect was positive in sign suggesting that in the process of growth, inequality rose and accentuated poverty, it could not neutralize the beneficial effects of growth on poverty (see Table 2). In the rural areas of Gujarat, Orissa, Rajasthan, and Uttar Pradesh including the urban areas of Haryana, Karnataka, Kerala, Punjab, and Rajasthan, the inequality effect turned out to be negative in sign suggesting that inequality fell in the process of growth and thus contributed along with the mean effect to a reduction in poverty. This is an interesting feature and needs further analysis, which is outside the scope of this paper, as to why inequality effect turned out to be beneficial in these states and not elsewhere.

Due to rising levels of urbanization (percentage of population residing in the urban areas) though urban poverty increased, the decline in the percentage of rural population ushered in more than a proportionate fall in rural poverty in several states such as Assam, Bihar, Haryana, Maharashtra, Orissa, Uttar Pradesh, and West Bengal. Thus in these states, the population shift effect helped the all-area combined poverty to decline during period 1 (see Table 2).

In the reform period (period 2), the growth effect continued to dominate over the other two effects, and it also accounted for much of the decline in the incidence of poverty in most of the states (see Table 3). The only exception in this respect is urban Orissa, where the observed poverty rose by 1.19 percentage points caused by both adverse growth and inequality effects. In urban India though the growth effect continued to be dominant in the reform period, it is interesting to note that the adverse effect of inequality fell in this period compared to the 1980s and became almost negligible. Moreover, despite a rise in the adverse effects of inequality in rural India in period 2 relative to the first, in a large number of states (e.g., rural areas of Bihar, Haryana, Kerala, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal) the inequality effect turned out to be beneficial in the sense that like the growth effect it too helped poverty to fall. This is possibly because growth became pro-poor in these states by generating employment opportunities. As regards the population shift effect, it continued to be beneficial at the all-India level. In other words, the fall in the incidence of rural poverty due to a decline in the percentage of the rural population continued to be more than the rise in the incidence of urban poverty caused by the rise in the level of urbanization in the 1990s. However, in terms of magnitude the population shift effect for all areas fell marginally from –0.3 in period 1 to –0.21 in period 2.

Table 2. **Decomposition of Change in Poverty between 1983 and 1993/4 (Period 1)**

	Growth			Inequality			Population			Total		
States	**Rural**	**Urban**	**All Areas**	**Rural**	**Urban**	**All Areas**	**Rural**	**Urban**	**All Areas**	**Rural**	**Urban**	**All Areas**
Andhra Pradesh	-28.69	1.3	-27.39	1.73	0.69	2.42	-2.17	3.81	1.64	-29.13	5.8	-23.33
Assam	4.96	-3.77	1.19	0.35	0.04	0.39	-1.48	0.5	-0.98	3.83	-3.23	0.6
Bihar	-8.72	-2.72	-11.44	0.1	0.06	0.16	-0.59	0.39	-0.2	-9.21	-2.27	-11.48
Gujarat	-12.54	-12.34	-24.88	-2.92	0.86	-2.06	-2.72	3.5	0.79	-18.18	-7.98	-26.16
Haryana	26.54	-7.79	18.75	1.25	-1.51	-0.26	-7.21	6.01	-1.19	20.59	-3.29	17.3
Karnataka	-11.75	-1.97	-13.72	0.03	-0.17	-0.14	-2.06	2.58	0.52	-13.78	0.44	-13.34
Kerala	-25.57	-12.06	-37.63	0.35	-0.06	0.29	-4.97	5.38	0.42	-30.18	-6.74	-36.92
Madhya Pradesh	-14.23	-2.58	-16.8	1.32	0.49	1.81	-2.5	2.83	0.33	-15.41	0.74	-14.66
Maharastra	-11.92	-5.15	-17.07	1.44	0.72	2.16	-3.69	3.35	-0.34	-14.17	-1.08	-15.25
Orissa	-22.75	-1.53	-24.28	-1	0.04	-0.96	-1.49	1.16	-0.34	-25.25	-0.33	-25.58
Punjab	-7.82	-21.71	-29.53	2.36	-0.83	1.53	-1.99	2.78	0.79	-7.45	-19.76	-27.21
Rajastan	-15.77	-4.64	-20.41	-0.12	-0.15	-0.28	-1.4	1.6	0.2	-17.29	-3.2	-20.5
Tamil Nadu	-27.42	-5.2	-32.62	0.28	0.36	0.63	-2.74	2.75	0.01	-29.88	-2.1	-31.98
Uttar Pradesh	-6.78	-6.23	-13.01	-0.38	0.34	-0.04	-1.71	1.65	-0.07	-8.87	-4.25	-13.12
West Bengal	-29.61	-4.98	-34.59	0.05	0.08	0.13	-0.9	0.47	-0.43	-30.46	-4.43	-34.89
India	-14.28	-5.66	-19.94	0.19	0.89	1.07	-2.59	2.28	-0.3	-16.68	-2.49	-19.17
CV	-113.64	-92.87	-77.26	392.03	951.82	309.56	-67.79	65.50	940.77	-93.72	-161.96	-76.42

Note: CV is coefficient of variation across the states (excluding all-India).

Table 3. **Decomposition of Change in Poverty between 1993/4 and 1999/2000 (Period 2)**

	Growth			Inequality			Population			Total		
States	**Rural**	**Urban**	**All Areas**	**Rural**	**Urban**	**All Areas**	**Rural**	**Urban**	**All Areas**	**Rural**	**Urban**	**All Areas**
Andhra Pradesh	-16.93	-14.43	-31.35	1.5	0.79	2.3	-0.06	0.16	0.09	-16.09	-14.08	-28.96
Assam	-11.72	-0.32	-12.04	1.01	0.11	1.12	-1	0.18	-0.82	-11.71	-0.03	-11.74
Bihar	-21.67	-0.43	-22.1	-0.28	0.04	-0.24	-0.12	0.08	-0.04	-22.07	-0.31	-22.38
Gujarat	-24.35	-18.31	-42.66	0.54	0.01	0.55	-1.23	1.51	0.28	-25.04	-16.79	-41.83
Haryana	-55.08	-8.55	-63.63	-1.82	0.39	-1.43	-0.16	0.11	-0.04	-57.06	-8.05	-65.11
Karnataka	-25.48	-14.14	-39.63	0.06	-0.48	-0.42	-1.29	1.78	0.49	-26.71	-12.84	-39.55
Kerala	-46.33	-3.56	-49.89	-0.23	0.16	-0.07	0.18	-0.22	-0.05	-46.39	-3.63	-50.01
Madhya Pradesh	-5.93	-5.62	-11.55	-0.45	-0.02	-0.48	-0.96	1.07	0.11	-7.35	-4.57	-11.92
Maharastra	-21.73	-9.52	-31.24	-1.14	0.31	-0.83	-1.83	1.84	0.01	-24.7	-7.36	-32.06
Orissa	-3.45	0.34	-3.11	0.43	0.01	0.44	-0.95	0.82	-0.13	-3.97	1.17	-2.8
Punjab	-34.23	-15.67	-49.9	1.82	0.5	2.32	-2.01	1.88	-0.13	-34.42	-13.29	-47.71
Rajastan	-35.5	-9.64	-45.14	-0.17	0.65	0.49	-0.22	0.27	0.06	-35.88	-8.71	-44.59
Tamil Nadu	-20.28	-20.36	-40.63	-0.38	0.52	0.14	-4.37	5.1	0.73	-25.03	-14.74	-39.76
Uttar Pradesh	-21.48	-2.16	-23.65	-0.05	-0.09	-0.14	-0.61	0.55	-0.06	-22.15	-1.7	-23.85
West Bengal	-17.62	-6.25	-23.87	-0.51	0.37	-0.14	-0.33	0.17	-0.16	-18.46	-5.71	-24.17
India	-22.12	-6.72	-28.83	1.59	0.04	1.63	-1.65	1.43	-0.21	-22.17	-5.25	-27.42
CV	-57.84	-79.41	-51.35	4284.22	151.03	430.90	-114.24	131.32	1495.49	-55.91	-80.35	-51.73

Note: CV is coefficient of variation across the states (excluding all-India).

Table 4. **Change in Growth, Inequality, and Population Shift Effects between Period 2 and Period 1**

	Growth			**Inequality**			**Population**			**Total**		
States	**Rural**	**Urban**	**All areas**	**Rural**	**Urban**	**All areas**	**Rural**	**Urban**	**All areas**	**Rural**	**Urban**	**All areas**
Andhra Pradesh	11.76	-15.73	-3.96 -0.23	0.1	-0.12	2.11	-3.65	-1.55	13.04	-19.88	-5.63	
Assam	-16.68	3.45	-12.97	0.66	0.07	0.73	0.48	-0.32	0.16	-15.54	3.23	-12.34
Bihar	-12.95	2.29	-10.66	-0.38	-0.02	-0.4	0.47	-0.31	0.16	-12.86	1.96	-10.9
Gujarat	-11.81	-5.97	-17.78	3.46	-0.85	2.61	1.49	-1.99	-0.51	-6.86	-8.81	-15.67
Haryana	-81.62	-0.76	-82.38	-3.07	1.9	-1.17	7.05	-5.9	1.15	-77.65	-4.76	-82.41
Karnataka	-13.73	-12.17	-25.91	0.03	-0.31	-0.28	0.77	-0.8	-0.03	-12.93	-13.28	-26.21
Kerala	-20.76	8.5	-12.26	-0.58	0.22	-0.36	5.15	-5.6	-0.47	-16.21	3.11	-13.09
Madhya Pradesh	8.3	-3.04	5.25	-1.77	-0.51	-2.29	1.54	-1.76	-0.22	8.06	-5.31	2.74
Maharastra	-9.81	-4.37	-14.17	-2.58	-0.41	-2.99	1.86	-1.51	0.35	-10.53	-6.28	-16.81
Orissa	19.3	1.87	21.17	1.43	-0.03	1.4	0.54	-0.34	0.21	21.28	1.5	22.78
Punjab	-26.41	6.04	-20.37	-0.54	1.33	0.79	-0.02	-0.9	-0.92	-26.97	6.47	-20.5
Rajastan	-19.73	-5	-24.73	-0.05	0.8	0.77	1.18	-1.33	-0.14	-18.59	-5.51	-24.09
Tamil Nadu	7.14	-15.16	-8.01	-0.66	0.16	-0.49	-1.63	2.35	0.72	4.85	-12.64	-7.78
Uttar Pradesh	-14.7	4.07	-10.64	0.33	-0.43	-0.1	1.1	-1.1	0.01	-13.28	2.55	-10.73
West Bengal	11.99	-1.27	10.72	-0.56	0.29	-0.27	0.57	-0.3	0.27	12	-1.28	10.72
India	-7.84	-1.06	-8.89	1.4	-0.85	0.56	0.94	-0.85	0.09	-5.49	-2.76	-8.25
CV	-212.86	-299.98	-166.38	-518.29	467.91	-950.42	138.65	-135.09	-1200.83	-229.41	-189.8	-163.95

Note: CV is coefficient of variation across the states (excluding all-India). Change is defined as the effect in period 2 minus the corresponding effect in period 1.

On the whole, the beneficial effect of growth on poverty increased in magnitude in period 2 relative to period 1 in several states both in the rural and urban areas (see Table 4). Except Andhra Pradesh, Madhya Pradesh, Orissa, Tamil Nadu, and West Bengal, the rural areas of all other states recorded an improvement in the growth effect. Similarly, except Assam, Bihar, Kerala, Orissa, Punjab and Uttar Pradesh, the urban areas of all other states registered an increase in the growth effect. The adverse effect of inequality corresponding to all areas (rural–urban combined) fell in several states like Andhra Pradesh, Bihar, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu, Uttar Pradesh, and West Bengal though at the all-India level it went up from 1.07 to 1.63 percent.

Based on Tables 2 and 3 different size classes have been formed representing the growth effects in both periods, and the states are distributed among these size classes. If the growth effect is greater than zero (> 0) it is considered to be adverse as it raises the incidence of poverty instead of reducing it. The higher the magnitude with a negative sign, the higher the beneficial growth effect. Table 5, which corresponds to the rural areas of the states, offers a mixed picture. While states like Andhra Pradesh, Madhya Pradesh, Orissa, Tamil Nadu, and West Bengal moved from relatively higher size classes in period 1 to relatively lower size classes in period 2, several other states moved to higher size classes of growth effect from the lower size classes over the same period. On the other hand in the urban areas, relatively few states like Kerala, Orissa, and Punjab moved down from higher size classes in period 1 to lower size classes in period 2 and states like Andhra Pradesh and Tamil Nadu experienced a perceptible rise in terms of growth effect (see Table 6). However, a large number of states remained in the same size class of growth effect in both the periods. But notwithstanding this stagnancy, the growth effect in the urban areas does not seem to have deteriorated in a large number of states.

It would be interesting to examine whether states with a higher growth effect particularly in the urban areas in the 1990s over the 1980s also experienced lower magnitudes of an adverse population shift effect in the urban areas. The answer is in the affirmative because several states like Andhra Pradesh, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh, and West Bengal, which recorded a higher growth effect in the urban areas in the 1990s relative to the 1980s also experienced a lower population shift effect in the urban areas. The only exception is Tamil Nadu.[2] In other words, these are the states where higher growth effects in the reform period slowed the rise in the incidence of urban poverty occurring in the process of urbanization. From this it may be inferred that as reforms enhanced the growth effects in the urban areas of several states, they also reduced the deleterious effects of population rise on poverty in the urban areas of the same states.

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[2] Tamil Nadu recorded a massive increase in urban population between the 1991 and 2001 census years possibly due to reclassification of rural areas in 1991 as urban in 2001. As a result there has been a decline in the rural population in 2001 compared to 1991, even in absolute terms. Decline in fertility alone could not have caused this because it could not have fallen only in the rural areas, but in both rural and urban areas. Also it is unlikely that fertility decline would bring in a fall in population in absolute terms. Rural-to-urban migration also

Table 5. **Cross-tabulation of States in Terms of Growth Effect on Poverty Changes for Two Periods: Rural Areas**

Growth Effect	**1993/4 – 1999/2000**					
(1983-1993/4)	**> 0**	**0 to -10**	**-10 to -15**	**-15 to -20**	**-20 to -25**	**-25 and above**
> 0			Assam			Haryana
0 to –10					Bihar Uttar Pradesh	Punjab
-10 to –15		Madhya Pradesh			Gujarat Maharastra All-India	Karnataka
-15 to –20						Rajasthan
-20 to –25		Orissa				
-25 & above				Andhra Pradesh West Bengal	Tamil Nadu	Kerala

Table 6. **Cross-tabulation of States in Terms of Growth Effect on Poverty Changes for Two Periods: Urban Areas**

	1993/4-1999/2000					
Growth Effect (1983-1993/4)	**> 0**	**0 to -10**	**-10 to -15**	**-15 to -20**	**-20 to -25**	**-25 & above**
> 0			Andhra Pradesh			
0 to –10	Orissa	Assam Bihar Haryana Madhya Pradesh Maharastra Rajasthan Uttar Pradesh West Bengal All-India	Karnataka		Tamil Nadu	
-10 to –15		Kerala		Gujarat		
-15 to –20						
-20 to –25				Punjab		
-25 & above						

could not have reduced the rural population in absolute terms. Rapid increase in so-called urban population caused urban poverty to rise.

It has been widely noted that economic growth varies considerably across areas; even within India, states have recorded different growth rates, which do not seem to have any tendency toward convergence in the long run (Sachs, Bajpai, and Ramiah 2002). Such divergence across states is noted not only in terms of growth in the state domestic product but also in terms of growth in average per capita consumption expenditure (Deaton and Dreze 2002). Among several factors that influence economic growth, industrial performance has been described as an engine of growth, implying that equalization of industrial productivity can bring in equalization of economic growth across space. In stepping up economic growth, industrialization is often cited, though from an argumentative point of view any sector can bring about in higher levels of growth. But since agriculture, particularly in a developing economy context, is severely constrained by social, institutional, and economic factors, it is less likely to accelerate economic growth. Besides, as per Kuznets's (1966) perception of modern economic growth, it is agriculture that loses its share both in terms of value added and work force in the process of economic growth. On the other hand, the tertiary sector value added cannot be interpreted similarly as the value added originating from the commodity-producing sector since factor (labor) income and value added are not distinguishable in the case of the tertiary sector. Besides, the concept of value added is not clear as regards various tertiary activities (Bhattacharya and Mitra 1990 and 1997). Hence, it is industry-led growth that has been the prime focus, and factors relating to manufacturing productivity are considered crucial for economic progress, enabling the low-income regions to catch up with their high-income counterparts within a finite time horizon. Hence, factors that explain interspatial variations in industrial productivity are indeed the cause of variations in economic growth too. In this paper it is argued that differences in growth are related to variations in industrial productivity across Indian states, hypothesizing that external economies of scale account for an important source of such variations.

Total factor productivity growth, which is an important index of industrial performance, can broadly be divided into two components: technological progress (or regress) and change in technical efficiency. While improvement in technology means an overall shift in the production function, rise in technical efficiency indicates movement toward the frontier or better utilization of the available technology. While factors like technology etc. are internal to the firm, availability of infrastructure, better quality of inputs, large demand potential in the local market, and cost relating to information sharing etc. are location-specific and hence external to the firm. The literature on such external economies of scale is vast and has recognized mainly two varieties: urbanization economies and localization economies. The paper's major contention is to dwell upon such factors, which are external to manufacturing firms and yet influence their productivity levels. Several studies in the past noted a strong positive association between economic growth and level of urbanization across Indian states (Gupta and Mitra 2004 Sachs, Bajpai, and Ramiah 2002). Hence, the present study provides a strong basis to hypothesize that external economies of scale related to degree of urbanization (or city size) are determinants of industrial productivity, which in turn is directly related to economic growth. It may be added here that economic reforms have a direct influence on productivity as infrastructure supply, concentration of activities, and other factors constituting the external economies of scale are likely to grow with reforms. Hence with differences in the level of reforms pursued across states, productivity and growth differentials are likely to grow, indicating the tendency of divergence rather than convergence. But the fact that reforms improve economic growth implies that the growth or mean effect on poverty also rises, though the variation in the mean effect across regions may actually fall as states with slower improvements in growth may show a tendency of catching up (in terms of mean effect on poverty) with states with higher growth. The demonstration effect of good governance in states with larger improvements in economic growth and in states with sluggish improvements in economic growth may contribute to this spirit of catching up. This means that as the slowly growing states imitate the lessons of good governance—a prerequisite of growth—from the rapidly growing states, the beneficial effects on poverty reduction start operating much before they actually start replicating the growth experience of the latter.

Table 7 gives figures on per capita net state domestic product, growth rate of state domestic product, share of manufacturing in state domestic product, and level of urbanization defined as the percentage of population living in urban areas. Based on state-specific figures on net domestic product, annual growth rates across states were calculated over the period 1990/1 through 1997/8. It may be noted that each of the variables across states varies over a wide range of values. Sachs, Bajpai, and Ramiah (2002) showed how the growth rates across states diverged in period 2 compared to period 1.

In some of the states like Bihar the per capita net state domestic product has been as low as Rs1073 in 1997/8 (in 1980/1 prices) whereas in some of the industrialized states like Gujarat and Maharashtra, and agriculturally prosperous states like Haryana and Punjab it has been almost four times higher. The growth rate of the state domestic product also shows high variability. At the lowest level is Bihar with a negligible growth rate of merely 0.5 percent per annum whereas Gujarat, Maharashtra, and West Bengal registered a growth rate of around 6.5 percent or more in the 1990s. Orissa is another state with a low per capita income, which recorded a growth rate of 4.6 percent per annum, whereas Uttar Pradesh with almost the same level of per capita income in 1997/8 experienced a growth rate of only 2.6 percent. On the other hand, other prosperous or moderately rich states in terms of per capita income at least did not experience sluggish economic growth. Hence, it may be suggested that rich states have shown a tendency of becoming richer whereas poor states by and large experienced a sluggish economic growth, though Orissa is a glaring exception.

Table 7. **State-specific Growth Rates, Urban Population, and Level of Industrialization**

State	**Per Capita NSDP (1997/8) (rupees/month in 1980 prices)**	**Annual Growth Rate of NSDP in 1980/1 Prices over 1990/1-1997/8 (%)**	**Percent Urban (1991)**	**Percent Urban (2001)**	**Share of Manufacturing in NSDP (1997/8) in 1980 Prices**
Andhra Pradesh	2413	3.97	26.78	27.08	19.73
Bihar	1073	0.54	13.14	10.47	14.39
Gujarat	3976	7.58	34.49	37.35	35.91
Haryana	3997	3.96	24.63	29.00	21.26
Karnataka	2761	5.81	30.92	33.98	30.14
Kerala	2444	5.59	26.39	25.97	13.66
Madhya Pradesh	1961	4.05	23.18	26.67	18.59
Maharashtra	4791	6.51	38.69	42.40	30.14
Orissa	1688	4.64	13.38	14.97	12.09
Punjab	4416	4.57	29.55	33.95	21.26
Rajasthan	2306	4.49	22.88	23.38	11.01
Tamil Nadu	3057	5.45	34.15	43.86	20.73
Uttar Pradesh	1757	2.62	19.84	20.78	15.37
West Bengal	3002	6.49	27.48	28.03	16.32

Note: Annual growth rates of net state domestic product (NSDP) are point-to-point estimates.

Sources: For rural–urban distribution of population for India and States/Union Territories see Census of India (2001); for estimates of state domestic product see Central Statistical Organization (2000).

The other two variables that also show wide variability are level of industrialization and urbanization. The share of manufacturing in total net domestic product has been more than 30 percent in some of the states like Gujarat, Karnataka, and Maharashtra. Agriculturally prosperous states like Haryana and Punjab also show a reasonably high level of industrialization (around 20 percent). On the other hand, Bihar, Orissa, and Rajasthan seem to have even less than 15 percent of net state domestic product originating from manufacturing. Keeping pace with the level of industrialization, urbanization also turns out to be high in Gujarat, Karnataka, Maharashtra, and Tamil Nadu. Punjab and Haryana also have around 34 and 29 percent of their population residing in urban areas, respectively. Bihar on the other hand turns out to be least urbanized. These patterns tend to suggest that states with higher urbanization have experienced higher industrialization, which in turn contributed to higher economic growth. With the initiation of economic reforms in the 1990s investments seem to have looked for spatially strategic opportunities so as to benefit from location aspects, which would enhance returns both by reducing cost and augmenting production. This provides a basis to hypothesize that agglomeration economies play a major role in enhancing total factor productivity growth and economic growth across states.

Having highlighted the importance of the industrial sector it may be worthwhile to mention that despite the limitations of the agriculture sector it has also played a major role in accelerating overall growth in states like West Bengal. The tertiary sector, notwithstanding the limitations associated with the concept of value added originating from this sector, has provided a boost in a big way to the overall growth of the economy. Several new components within the tertiary sector, i.e., information technology and business process outsourcing services, have emerged and contributed to the overall growth of the economy. Similarly the expansion in financial institutions and infrastructure services also needs to be recognized. It would be erroneous to ignore these developments and treat them as unproductive. Since these activities have grown differently in different states in the reform period, divergences in growth are possibly related to the differentials as well.

Notwithstanding the divergences in growth, the convergence in the growth/mean effect on poverty in the reform period is quite evident from Tables 2 and 3. From the decomposition analysis, in the coefficient of variation of the growth/mean effect across states, a perceptible decline seems to have taken place in period 2 compared to period 1. In the rural areas it dropped from 113.64 in the 1980s to 57.84 in the reform period, and in the urban areas the fall was from 92.87 to 79.41 during the same period. This tends to support the argument that despite the divergence arising from economic reforms pursued at different levels across states, the beneficial effects with regard to poverty reduction has a converging tendency.

V. CONCLUSION

This paper assesses the impact of economic reforms on poverty using a decomposition analysis splitting the percentage change in the incidence of poverty between two time points in terms of growth/mean effect, inequality effect, and population shift effect. The two time periods are from 1983 to 1993/4 and from 1993/4 to 1999/2000, described as pre-reform and reform periods, respectively, though strictly speaking, reforms were initiated in July 1991. While the growth/mean effect has been dominant and has resulted in a decline in the incidence of poverty in both periods and in most of the states, inequality, which in general rose in the process of growth, raised the poverty ratio at the all-India level. However, in the rural areas of a large number of states the inequality effect turned out to be beneficial during the reform period. Even in the urban areas of several states and at the all-India level the adverse inequality effect fell considerably in the reform period compared to the pre-reform period. The population shift effect, which measures the net effect of a rise (and fall) in the percentage of population residing in urban (and rural) areas on the incidence of poverty, appeared to be beneficial in at least seven of the 15 major states and at the all-India level in both periods. In other words, the overall incidence of poverty in these states fell, though rural–urban migration might have raised the incidence of urban poverty.

Economic reforms have been pursued at different levels across the states, and this seems to have enhanced interstate variations in economic growth. Other than the role of agriculture in a few states like West Bengal, the rapid growth of new components of the tertiary sector, such as information technology, business process outsourcing services, financial institutions, and infrastructure services have impacted upon economic growth in varying degrees across states. Besides, economic growth is also dependent on industrial productivity, which in turn is a function of agglomeration economies. Economic reforms seem to have generated an effect on factors, which broadly fall into this class of agglomeration economies, and hence, economic growth across states has shown divergence instead of convergence. But, interestingly, the beneficial growth/mean effect on poverty increased in magnitude in most of the states in the reform period relative to the pre-reform period and more importantly, its variation across states dropped considerably. This is possibly because of good governance in the rapidly growing and reforming states, and the demonstration effect of this in the slowly growing states. The deleterious effect of inequality on poverty also shows a declining tendency in several states in the reform phase compared to its previous period, possibly because growth became pro-poor. The population shift effect, which showed a tendency of raising urban poverty, also fell in magnitude in the reform period compared to the pre-reform period across states. States with greater beneficial growth effects in the reform period relative to the first period also show lower adverse population shift effects (rural–urban migration) in the urban areas, or a relatively slower rise in the incidence of urban poverty due to the population shift effect. Reforms seem to have a close association with the rise in growth effects, indicating that both economic growth and its ability to reduce poverty are achieved in the reform process. A strategy of growth with employment generation would help the poor benefit from economic reforms, enhancing not only the growth effect but also making inequality and population shift effects more beneficial to poverty reduction.

REFERENCES

Ahluwalia, M. S., 1978. "Rural Poverty and Agricultural Performance in India." *Journal of Development Studies* 14(3):298-323.

Asian Development Bank, 1999. *Fighting Poverty in Asia and the Pacific: The Poverty Reduction Strategy.* Manila, Philippines.

Banerjee, B., 1986. *Rural to Urban Migration and the Urban Labor Market.* Bombay: Himalaya Publishing House.

Bhattacharya, B. B., and A. Mitra, 1990. "Excess Growth of the Tertiary Sector: Issues and Implications." *Economic and Political Weekly* 3:2445-50.

———, 1997. "Changing Composition of Employment in Tertiary Sector: A Cross-country Analysis." *Economic and Political Weekly* 15:529-534

Census of India, 2001. *Primary Census Abstract.* Registrar General, Government of India.

Central Statistical Organisation, 2000. *Estimates of State Domestic Product.* Government of India.

Chen, S., and M. Ravallion, 2000. *How Did the World's Poorest Fare in the 1990s?* World Bank, Washington DC.

Datt, G., and M. Ravallion, 1992. "Growth and Redistribution Components of Changes in Poverty Measure: A Decomposition with Application to Brazil and India in the 1980s." *Journal of Development Economics* 38:275-95.

Deaton, A., and J. Dreze, 2002. "Poverty and Inequality in India: A Re-examination." *Economic and Political Weekly* 7:3729-48.

Foster, J., J. Greer, and E. Thorebecke, 1984. "A Class of Decomposable Poverty Measures." *Econometrica* 52(3):571-6.

Gupta, I., and A. Mitra, 2004. Economic Growth, Health and Poverty: An Exploratory Study on India. *Development Policy Review* 22(2):193-206.

Jain, L. R., and S. D. Tendulkar, 1990. "Role of Growth and Distribution in the Observed Change in Headcount Ratio Measure of Poverty: A Decomposition Exercise for India." *Indian Economic Review* XXV(2):165-205.

Kakwani, N., 2000. "On Measuring Growth and Inequality Components of Poverty with Application to Thailand." *Journal of Quantitative Economics* 16(1):67-79.

Kakwani, N., and E. M. Pernia, 2000. "What is Pro-poor Growth?" *Asian Development Review* 18(1):1-16.

Kakwani, N., and K. Subbarao, 1990. "Rural Poverty and Its Alleviation in India." *Economic and Political Weekly* 25:A2-16.

Kakwani, N., B. Prakash, and H. Son, 2000. "Growth, Inequality, and Poverty: An Introduction." *Asian Development Review* 18(2):1-21.

Kuznets, S., 1966. *Modern Economic Growth: Rate, Structure and Spread.* New Haven: Yale University Press.

———, 1955. "Economic Growth and Income Inequality." *American Economic Review* XLV(1):257-87.

Mazumdar, D., and H. H. Son, 2002. "Vulnerable Groups and the Labor Market in Thailand: Impact of the Asian Financial Crisis in the Light of Thailand's Growth Process." Paper presented at a Workshop on Impact of Globalization on the Labor Markets, National Council of Applied Economic Research, Delhi.

Mitra, A., 1992. "Growth and Poverty: The Urban Legend." *Economic and Political Weekly.* March 28. Pages 659-65.

———, 1994. *Urbanization, Slums, Informal Sector Employment and Poverty: An Exploratory Study.* New Delhi: D. K. Publishers.

———, 1997. "Infrastructure and Human Development." *Productivity* 38(2):200-6.

National Sample Survey Organization, various years. *Sarvekshana, 1985, 1995, 2000.* Government of India.

Papola, T. S., 1981. *Urban Informal Sector in a Developing Economy.* New Delhi: Vikas Publishing House.

Planning Commission, 2002. *National Human Development Report 2001.* New Delhi, India,

Ravallion, M., and G. Datt, 1996. "How Important to India's Poor is the Sectoral Composition of Economic Growth?" *The World Bank Economic Review* 10(1):1-25.

Sachs, J. D., N. Bajpai, and A. Ramiah, 2002. Understanding Regional Economic Growth in India. CID Working Paper No. 88, Center for International Development, Harvard University.

Sundaram, K., 2001. "Employment and Poverty in 1990s: Further Results from NSS 55th Round, Employment-Unemployment Survey, 1999-2000." *Economic and Political Weekly.* August 11. Pages 3039-49.

Tendulkar, S. D., and L. R. Jain, 1995. "Economic Growth, Relative Inequality, and Equity: The Case of India." *Asian Development Review* 13(2):139-68.

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